UNIT 1 INTRODUCTION, DEFINITION AND CONCEPT OF PSYCHOLOGY

Structure

1.0 INTRODUCTION

Psychology is concerned with almost all aspects of our lives. That is why, every one is interested to know about psychology. But, there are many misconceptions about psychology. Many people think that psychology deals with treating mad people. Some others feel that psychologists can read your mind just by looking at you or your face/forehead. They tend to equate psychologists with astrologers, gemologists, numerologists, palmists or graphologists, who claim to solve your problems of life and predict your future.

You might have heard the terms 'psychology', 'psychological', 'mental' etc., but do you know what is the meaning of psychology and how did it evolve? Is psychology a 'science' or 'art'? What is science and what are its characteristics? What is the subject matter of psychology? In this unit you will find answer to these and many more such questions.

By studying psychology, you will be able to understand what psychology is and what it is not. This unit introduces the subject of psychology.

1.1 OBJECTIVES

On successful completion of this unit, you will be able to:

- Describe the origin and evolution of psychology.

- Define psychology.
- Explain Psychology as a Science.
- Elucidate the characteristics of Science.
- Describe the nature and characteristics of behaviour.
- Explain 'Pseudo-Psychology'.
- Identify the tasks of Psychology.

1.2 PSYCHOLOGY: ITS ORIGIN AND EVOLUTION

The origin of psychology dates back to 1870s. The term 'Psychology' is derived from two Greek words; *Psyche* means "soul or breath" and *Logos* means "knowledge or study" (study or investigation of something). The word 'Psychology' was not in common use before the nineteenth century, and the field of psychology did not actually become an independent science until the middle of the nineteenth century.

Psychology emerged as an independent academic discipline in 1879, when a German Professor Wilhelm Wundt established the first psychology laboratory at the university of Leipzig, Germany. According to Bolles (1993), Wundt was a medical doctor by training and early in his career, he was fortunate to work with some of the great physiologists of the nineteenth century. Fittingly, his laboratory was established during the time he spent as a professor of philosophy. (Remember, the intellectual roots of psychology lie at the union of philosophy and physiology). Wundt is traditionally recognised as the founder, or father of the modern psychology, and 1879 is seen as the year that psychology finally emerged as a unique field. Prior to Wundt, it was not possible to major in psychology, because there were no official psychologists or psychology departments. Wundt started studying the structure of *mind* which meant the immediate (conscious) experience, the contents and processes of subjective experience such as sensations, thoughts, feelings and emotions.

Thus, formally, psychology was recognised as an independent science in 1879. Let us now look at how psychology has been defined.

1.3 DEFINITION OF PSYCHOLOGY

Psychology has been defined in a number of ways by various authors. Psychologists had been debating on whether psychology should focus on "mind", "consciousness" or "behaviour". Let us look at how the definitions of psychology have come a long way over the past 130 years.

1.3.1 Early Definitions

According to Bagga & Singh (1990), the term Psychology was first used by Rudolf Goeckle, in 1950. They have chronologically given the definitions of psychology.

Earlier, psychology was part of Philosophy. Ancient philosophers were interested in the study of the soul. Thus, it was first defined in terms of 'the science of soul'. However, since the term 'soul' has very wide and comprehensive meanings,

it was considered as a vague term and was criticized severely, in the middle ages. There were questions regarding the physical existence, weight, and volume of soul.

Dandapani (2004) states that "people were rather naïve to believe in esoteric terms such as Soul, Mind and Consciousness. It was believed, and rightly so, that every human being is endowed with a Soul that would remain sublime at all times. To a philosopher soul is the firm foundation upon which ethical values are erected. Realisation of one's soul was considered the chief mission of life…….. Definition of Psychology as the study of soul became unacceptable primarily because no convincing proof or evidence of the precise nature of soul was furnished. It was discarded because of its METAPHYSICAL nature. It was found inadequate to satisfy the canons of science;…….".

Thus, this definition was not accepted by psychologists.

Next, psychology was defined in terms of 'the science of mind', by some ancient Greek philosophers. According to them, psychology was held as a branch of mental philosophy. Since this definition does not include overt behaviour of human beings and mind cannot be measured directly, this definition was also dropped by psychologists.

Then, psychology was defined as 'the science of consciousness'. According to Bagga & Singh (1990), at one time during the history of Psychology, it was felt that the main business of Psychology was to the conscious experience. Consciousness makes us conscious or aware of the situation or a thing around us. This definition too is now obsolete and it has been rejected due to the following reasons:

Consciousness cannot be studied objectively as it is more personal and subjective.

Second objection came from the fast developing branch of the abnormal psychology which brought the study of unconscious part of our mind within the province of Psychology.

The term consciousness does not include animal or human behaviour.

The term consciousness also was supposed to have a philosophical-tinge and not accepted by the modern scientific minded psychologists.

Finally, modern Psychology has been defined as 'a science of behaviour.' In the early decades of twentieth century, Watson, the father of the school of 'Behaviourism', defined psychology as 'the study of behaviour'. According to Morgan et al. (1986), Watson rejected mind as the subject of psychology and insisted that psychology be restricted to the study of behaviour – the observable (or potentially observable) activities of people and animals. Watson held that there are no essential differences between human and animal behaviour and that we can learn much about our own behaviour from the study of what animals do. Watson emphasised that nothing is innate and everything can be learned.

In this context, Woodworth (1948) had earlier stated that, first psychology lost its soul, then its mind, then it lost its consciousness. It still has behaviour of sort.

As we will see below, the term 'behaviour' is still there in almost all the modern definitions.

1.3.2 Current Definitions

Hilgard, Atkinson, & Atkinson (1975) have compiled the changing definitions of psychology starting from that of William James (1890) to that of Kenneth Clark and George Miller (1970). Bagga & Singh (1990) have also cited the following two definitions of Woodworth and Munn, respectively:

"Psychology is the scientific study of the activities of the individual in relation to his environment".

"Psychology today concerns itself with the scientific investigation of behaviour, including from the stand-point of behaviour, much of what earlier psychologists dealt with as experience".

Some of the more recent definitions of Psychology, in chronological order, are as follows:

- Psychology is the science of human and animal behaviour. It includes the application of this science to human problems. (Morgan et al., 1986)
- The scientific study of behaviour and mental processes. (Feldman,1996)
- The scientific study of behaviour and mental processes and how they are affected by an organism's physical state, mental state and external environment (Tavris and Wade, 1997)
- Psychology is all about human behaviour, about mental processes, and about the context in which behaviour and mental processes occur. (Das, 1998)
- The science of behaviour and mental processes. (Lahey,1998)
- The science of behaviour and cognitive processes. (Baron, 1999)
- Scientific study of behaviour and mind. (Nairne, 2003)
- A science in which behavioural and other evidence is used to understand the internal processes leading people (and members of other species) to behave as they do. (Eysenck, 2004)
- The scientific study of behaviour and mental processes. (Ciccarelli & Meyer,2006; Coon & Mitterer, 2007, 2008)
- The science that studies behaviour and mental processes.(Rathus,2008)

As is evident in the above definitions, study of behaviour (human and animal) has been emphasised in all of them. In addition, most authors have also included 'cognitive/mental processes' in their definitions of psychology. But, what is behaviour? We will now look at the nature and characteristics of behaviour.

1.3.3 Nature and Characteristics of Behaviour

Behaviour is a broad term and a complex phenomenon. In this section, we will discuss the nature and characteristics of behaviour. According to psychologists, behaviour is every thing or any thing that a human being or animal does that can be observed in some way. In other words, behaviour includes all actions and responses of organisms that can be measured directly or indirectly. Behaviour not only means bodily movements but also can include mental and cognitive processes such as feelings, attitudes, thoughts, emotions, and all other internal vents, which cannot be observed directly but can be measured indirectly through what people say (vocal behaviour) and how they react to different problems and situations.

We will now consider some of the general characteristics of human behaviour, as described by Parameswaran & Beena (1988, 2002). These are:

- Behaviour is influenced by a number of factors

Behaviour is influenced by a number of factors such as biological, cultural, social, environmental, past experience, motivational, emotional, cognitive (e.g. feelings, emotions, motivation, thoughts) etc.

- Behaviour varies in complexity

Behaviour can be as simple as picking a pen, waving a friend or reflex responses like sneezing etc. Some other behaviours include certain skills which become a habit over a period such as playing guitar, cycling etc. Yet some other behaviours involve complex activities like repairing a car. Activities such as landing on the moon, flying a fighter plane, rock climbing etc. are some of the examples of highly complex behaviour.

- The factors influencing behaviour are of different kinds

Behaviour is influenced by two large sets of factors:

i) Those belonging to the individual; and

ii) Those belonging to the environment.

Factors pertaining to an individual can be categorized under physiological (biological needs such as hunger, thirst etc.) and psychological (ideas, opinions, attitudes etc.).

The environmental factors include physical surroundings, family and friends, the larger society and even the overall cultural and social background.

- Individual differences

Behaviour also varies from one person to the other as well as from one group of people to the other group of people. People differ in their physiological and bodily conditions, in their past experiences, in their abilities, in their background etc. It is therefore, natural that if ten people are put in same situation, each person's behaviour differs from that of others, in some respects or in some degrees.

- Behaviour also shows similarities

Though behaviour differs from person to person but this does not mean that all people differ from all others, at all times, and in all situations. There is also a considerable degree of similarity in behaviour among people. For instance, if a particle of dust falls into a person's eye, he/she tries to remove it. This type of behaviour is universally found.

- Behaviour is always purposeful and goal directive

Human behaviour is always purposeful and one's actions are always directed towards some goal or the other. A boy sitting and studying suddenly gets up and takes a glass of water. Here, the goal is to have a glass of water and the purpose is to quench his thirst. On the other hand, a boy is sitting and studying and feels cold. He gets up and switches off the fan. Here the goal is to switch off the fan and the purpose is to avoid the discomfort of cold. So, all our behaviours can be categorized under:

i) Approach behaviour (Positive goal directed) or

ii) Avoidance behaviour (Negative goal avoidance)

- Behaviour is changeable to a large extent

It was mentioned earlier that a number of factors influence behaviour. In view of this, it is possible to change behaviour by modifying these factors. It is this changeability which enables a child to become adult, a bad man to become a good man and a good man to become a bad man. It is again this very characteristics which helps people to adjust to new surroundings. These changes are the results of one's practice or experiences (learning).

- Behaviour also shows stability

Though emphasis has been laid on the possible changes in behaviour, it must be mentioned that life is not always full of all sorts of changes. While behaviour changes, at the same time there is also a certain stability in behaviour. It does not change with every change in the environment nor do all forms of behaviour change. Human behaviour shows a lot of stability. For instance, you may still find your grandmother preferring old ideas and old ways of life, though she is living in an ultra modern society.

- Behaviour is integrated

As already mentioned, behaviour is influenced by a number of factors and a variety of purposes. Every human being has physiological, psychological, personal and social purposes.

He/she has also been the subject of different learning experiences. In spite of all this, behaviour always shows an order and a hierarchy of purposes. Every individual behaves as a total person and this process of the organisation of different purposes, different learnings and different influencing factors results in an integration of behaviour.

Thus, an individual put in different situations, still shows certain characteristic ways and styles of behaviour which help us to understand and predict his/her behaviour. We often say, Ram is a pleasant person. Gobind is an unpleasant person, Krishna is a sociable person and so on. Psychologists use the term Personality to describe this process of integration. The greater the degree of integration in a person's behaviour, the more effective his behaviour is likely to be.

It can therefore be appreciated that behaviour is a complex phenomenon and studying behaviour is not an easy task.

1.4 PSYCHOLOGY, AS A SCIENCE

Psychology has been defined as a science of behaviour. But is it a science like physics, chemistry, biology and zoology or some thing different? In this section we will look at some of the definitions of science. We will also discuss the nature and characteristics of science and understand psychology, as a science.

Let us look at the following definitions of science:

- Science is a systematized body of knowledge gathered through carefully observing and measuring events (Morgan et al.,1986).

- Science is approach to knowledge, based on systematic observation (Lahey,1998)

The sole aim of science is to classify, understand, and unify the objects and phenomena of the material world. By using a combination of accurate observation and experimentation, logic and intuition, scientists seek to understand the rules that govern all levels of the natural universe. We will now describe the characteristics of science.

1.4.1 Characteristics of Science

The observation of events are systematized in various ways, but mainly by classifying and establishing general principles and laws to describe and predict new events as accurately as possible. Psychology studies behaviour in the same way that the other sciences study their subject matter and therefore shares a number of features with them. In common with other sciences, psychology, as a science, has the following characteristics, as described by Morgan et al. (1986).

- Empirical observation

Psychology, as a science, is first of all, and above all, *empirical*. That is to say, it rests on experiment and observation, rather than on argument, opinion, or belief.

- Systematic approach and theory

Data from observations and experiments are essential to science, but for them "to make some sense" in helping us to understand events, they must be ordered in some way. The scientist tries to find a limited number of principles which will summarize the data economically. Scientific theories are important tools for the organisation of data.

- Measurement

Another distinguishing feature of many sciences is measurement, defined as assignment of numbers to objects or events according to certain rules. Physics is ranked highest (most scientific) among the sciences as it has developed the most precise measurements.

- Definition of terms

Careful definition of terms is essential to clear thinking in science. The procedure in psychology is to define concepts by relating them to observable behaviour (operational definition). When we define a concept operationally, we define it in terms of measurable and observable operations. For example, the concepts of length, height in physics, and concepts like intelligence, motivation, personality in psychology are defined in terms of observable operations, which can be performed to measure them. However, psychology cannot measure many behaviours such as bravery, friendship, love, beauty etc. as these cannot be defined operationally.

The above characteristics are common to all sciences including psychology. However, psychology is a different type of science (Behavioural science). In physics or chemistry, researchers investigate processes and events which remain stable and constant to a large extent. This makes it possible to measure and predict with a reasonable degree of accuracy. But it is not the case with human behaviour, which is highly complex, not easily controllable, and appears to be

much more unpredictable than the reactions of physical and chemical substances. Whereas other sciences investigate things around man, psychology studies man himself. The methods used in psychological research include observation, interviews, psychological testing, laboratory experimentation, and statistical analysis.

Thus, psychology is categorized under the youngest group of scientific inquiry, the 'Social/Behavioural Sciences', which also includes subjects like anthropology, economics, education, geography, history, linguistics, sociology etc.(Rush, 1972). The first group of sciences are the 'Physical Sciences', which include subjects like physics, chemistry etc. Next is the 'Biological / Life Sciences' that include such subjects as biology, botany, zoology etc.

The application of knowledge to practical problems is an *art*; it is the skill or knack for doing things which is acquired by study, practice and special experience. Since principles and laws of psychology are applied to solve human problems in a number of situations (families, schools, organisations, environment) as well as treating behaviour disorders and emotional problems, it is also an art.

1.4.2 Psychology: What it is and what it is not

Psychology is an exciting field. It is at once familiar, exotic, surprising, and challenging. Most of all, psychology is changing. Psychology is about each of us. It asks us to take a reflective attitude as we inquire, "How can we step outside of ourselves to look objectively at how we live, think, feel, and act?" psychologists believe the answer is through careful thought, observation, and inquiry. (Coon & Mitterer, (2008).

According to Parameswaran & Beena (2002), some people regard psychology as a part of philosophy. Others equate it with magic. Some view it as madness. Still others are of the opinion that psychologists are either mystics or mysterious people, their interest in psychology mainly arises from uninformed curiosity. They are of the view that if they studied psychology, they would learn about miracles, mysteries, madness and that it would be an exotic experience. Many of them feel that the main use of psychology is in treating mentally ill individuals. While certainly this is an important area of application, it is not the only area. Today, psychology finds useful applications in an individual's life almost from the womb to the tomb.

Psychology, like all academic disciplines, has its own concepts such as *intelligence, personality, stress, learning, memory, thinking, perception* etc. Many of the concepts of psychology are familiar to you, but many of them are new. The topics included in psychology are: the nervous system, sensation and perception, learning and memory, intelligence, language and thinking, growth and development, motivation and emotion, personality, stress, psychological disorders, ways of treating those disorders, sexual behaviour, and the behaviour of people in social settings such as groups and organisations.

The goals of psychology, like other sciences, are to *describe, explain, predict and control* (Coon & Mitterer, 2008*)* the phenomena it studies. Psychology, thus, attempts to describe, explain, predict and control behaviour and mental processes. Psychology as a science of behaviour, attempts to explain the 'why' and 'how' of behaviour. The knowledge of psychology can also be applied to solve various

problems facing human beings, be it at home, society, work place or in the whole world. However, there are many 'professionals' who practice applying psychology without any type of training in psychology. They are somewhat like quacks or 'jhola chhap' doctors. They may be called 'pseudo-psychologists'. In order to further clarify, let us describe some of the pseudo-psychologies.

1.4.3 Pseudo-Sciences/Pseudo-Psychology

A gemologist, graphologist, numerologist, palmist or an astrologer, all claim to solve your problems of life and predict your future. They seem to be psychologists. But these disciplines are categorized under "pseudo- psychology" or "pseudo-sciences".

A Pseudopsychology is any unfounded system that superficially resembles psychology. Many pseudopsychologies give the appearance of science but are actually false. (*Pseudo* means "false"). Pseudopsychologies change little over time because their followers avoid evidence that contradicts their beliefs. Scientists, in contrast, actively look for contradictionsas a way to advance knowledge. They are skeptical critics of their own theories (Schick & Vaughn, 2001).

Descriptions of some of the pseudo-psychologies are given below:

1) **Palmistry:** False system that claims to reveal personality traits and to predict the future by "reading" lines on the palms of the hands. It is also called 'chiromancy'. 'Chiromancy' comes from the Greek word for hand (Cheir). The most famous 19th century palmist, went by the name of *Cheiro*.

   Palmistry is the practice of telling fortunes from the lines, marks and patterns on the hands, particularly, the palms.

2) **Phrenology:** False and antiquated system based on the belief that personality traits are revealed by the shape of the skull. Phrenology was started in the 19th century by a German anatomy teacher, Franz Gall. His theory - 'Personality was revealed by bumps on the skull'.

   - Phrenologists assumed that parts of the brain governed different personality characteristics.
   - Like muscles, parts of the brain that were used more often, tended to get bigger. In turn, these enlarged areas pushed on the skull causing bumps.
   - With advances in Neurology, this was shown to be impossible, and phrenology declined.
   - Although some brain areas do have specific functions, they are not directly related to specific personality traits.

3) **Graphology:** False system based on the belief that handwriting can reveal personality traits.

   - Indicates that personality is revealed by a person's handwriting.
   - Some companies in USA use handwriting analysis to evaluate job applicants.
   - Definitely, valuable in detecting forgeries.
   - Careful test of accuracy in psychological studies have shown that graphologists score close to zero in rating personality.

4) **Numerology:** False system based on the belief that personality traits are revealed by certain numbers, usually birthdays (date, month and year).They are the database from which a numerologist is able to describe you, sight unseen. Number values are assigned to the letters in your name. By adding these, with the numbers in your birth date, in a multitude of combinations, a numerologist establishes your key numbers. He then interprets the meaning of these key numbers, which results in a complete description of your personal characteristics.

5) **Astrology:** False system based on the belief that human behaviour is influenced by the position of planets and stars. It is based on the assumption that the position of the planets and stars at the time of a person's birth determines personality characteristics and affects behaviour.

In its modern guise, astrology is based on the assertion that the apparent positions of certain objects in the solar system at the time an individual is born, are somehow correlated with his or her personality, activities, preferences and even major life events such as marriages, divorces, accidents etc.

Pseudo-psychologies are not supported by scientific evidence. Belief in pseudo-psychologies is based on the following thinking errors:

i) Uncritical acceptance: The tendency to believe generally positive or flattering descriptions of oneself.

ii) Fallacy of positive instances: The tendency to remember or notice information that fits one's expectations, while forgetting discrepancies.

iii) Barnum effect: The tendency to consider a personal description accurate if it is stated in general terms. (Coon & Mitterer, 2008).

Psychology is neither common sense nor pseudoscience. Contrary to pseudo-sciences scientific psychology is based on objectivity, empirical evidence and critical thinking.

Self Assessment Questions

1) The term psychology is derived from two Greek words: ..... and .....

2) Psychology was first defined in terms of:

   a) Soul b) Mind c) Consciousness d) Behaviour

3) Psychology is defined as the science of ..... and .....

4) Following does not come under Pseudo Psychology:

   a) Astrology b) Graphology c) Astronomy d) Palmistry

1.4.4 Principles of Critical Thinking

According to Rathus (2008), psychologists are guided by scientific principles, and one hallmark of science is *critical thinking*. A group of psychologists (McGovern 1989) defined the goals of critical thinking as fostering the following thinking skills:

- Development of skepticism about explanations and conclusions.
- The ability to inquire about causes and events.
    i) Increased curiosity about behaviour
    ii) Knowledge about research methods.
    iii) The ability to analyse arguments critically.

According to Beyer (1995), critical thinking means reasoned judgments (logical and well thought out judgments).

Let us now consider some principles of critical thinking, as pointed out by Rathus (2008). These are as follows:

1) **Be skeptical:** Keep an open mind. Politicians and advertisers try to persuade you. Accept nothing as the truth until you have examined the evidence.
2) **Examine definition of term:** Some statements are true when a term is defined in one way but not when the term is defined in another way. So try to follow the real meaning of a term.
3) **Examine the assumptions or premises of arguments:** Consider the statement that one can not learn about human beings by engaging in research with animals. One premise in the statement seems to be that human beings are not animals. One premise in the statement seems to be that human beings are not animals. We are, of course, social animals.
4) **Be cautious from drawing conclusion from evidence:** Suppose you see a driver drinking, before he/she met with an accident. You are too quick to draw a conclusion that 'drinking was the cause of accident'. However, there may be other causes such as bad road , mechanical failure or fault of the other driver. One or more of which might have been the cause of the accident.
5) **Consider alternative interpretations of research evidence:** You read a statement based on a research that, frustration leads to aggression. However, all frustrated people are not necessarily aggressive. Similarly, aggressive behaviour is not due to frustration alone. Though research evidence is accepted without question, researchers may differ in their interpretation of the same. So, you must think of other alternative interpretations of results rather than blindly accepting the explanation given by a researcher.
6) **Do not over simplify:** Most human behaviour involves complex interaction of genetic and environmental influences. Also consider the issue of whether psychopathy helps people with psychological problems. A broad answer to this question? simple yes or no ? might be over simplifying. It is more worthwhile to ask, *What type of psychopathy,* practiced by *whom,* is most helpful, for *what kind of problem?*
7) **Do not over generalise:** Consider the statement that one can not learn about human beings by engaging in research with non human animals. Is the truth of the matter an all-or-nothing issue.
8) **Apply critical thinking to all areas of life:** A skeptical attitude and a demand for evidence are not only useful in college but are of value in all areas of life. Be skeptical when you are bombarded by TV commercials, or when political causes try to sweep you up or when you see the latest cover stories about unidentified flying objects etc.

These are the kinds of principles that guide psychologists' thinking as they observe behaviour, engage in research, or advise clients, as to how to improve the quality of their lives. Now let us look at the nature of tasks psychologists are engaged in.

1.4.5 The Tasks of Psychology

Parameswaran & Beena (2002) have suggested the tasks of psychology, which are described as follows:

1) Firstly, a science of behaviour should observe, investigate and identify factors which influence behaviour and also assess their relative influences.

2) It must investigate the role of each of these factors, separately and together in producing similarities and differences in behaviour.

3) Based on these investigations, psychology should arrive at generalisations in the form of theories, laws and principles explaining the similarities and also the differences in behaviour

4) It should also explain the complimentary functions of the factors and the processes, in generating similarities as well as differences among people.

5) Since behaviour is purposive, psychology must investigate the nature, kinds and number of purposes, their origin and development, and the relationship among them.

6) Since behaviour changes, it is the responsibility of psychology to study and explain the nature of such changes, kinds, the processes which govern them and the interaction among different kinds of changes.

7) While changes in behaviour are to be understood, stability and consistency in behaviour also need to be explained.

8) The master concern of psychology is to explain how change and stability, similarities and differences, are organised and integrated to produce both generality and uniqueness in behaviour.

Psychologists are engaged in the above tasks, and they are thus, quite different from pseudo-psychologists.

Self Assessment Questions

1) Topics included in Psychology are:

   a) Learning b) Memory c) Thinking d) All of them

2) Physics is to Physical Sciences as Psychology is to ..... Sciences

3) The goals of Psychology are to ....., ..., ... and ..... behaviour

4) The first laboratory in Psychology was established in the year .....

5) The first laboratory in Psychology was established by ....

6) Psychology is the study of Human and ..... behaviour.

1.5 LET US SUM UP

We have discussed the origin and evolution of psychology as an independent academic discipline. We have also defined psychology and discussed the nature and characteristics of science and behaviour.

Further, we have also discussed the meaning and concept of psychology, and the principles of critical thinking that guide psychologists. Finally, some of the pseudo-psychologies have been described and the tasks of psychologists have been highlighted.

This introduction to the meaning and concept of psychology is useful to students or anybody who wants to learn psychology, in clarifying some of the misconceptions of psychology, understand and appreciate psychology, as a scientific discipline, and make them informed consumers of psychological researches.

1.6 UNIT END QUESTIONS

1) Discuss the origin and evolution of psychology.
2) What are the differences between psychology and pseudo- psychology ?
3) List the topics covered by psychology.
4) Enumerate the characteristics of behaviour.
5) Try and think of some examples of pseudo- psychologies that you have believed or that you have seen others following one or more pseudo-psychologies. What is your experience?
6) Describe the characteristics of science. Describe psychology as a science.
7) Illustrate the tasks of psychologists.
8) Explain the principles of critical thinking.
9) Define psychology.

1.7 GLOSSARY

Behaviour : Observable actions and responses of human beings and animals. Behaviour also includes not so directly observable activities, such as, inner mental (cognitive) processes (e.g. feelings and thoughts)? as long as they can be observed and measured in a systematic way.

Behaviourism : Emphasises that psychology should focus on behaviour rather than on mind.

Critical thinking : Critical thinking means reasoned judgments (logical and well thought out judgments).

Pseudo-psychology : Any unfounded system that superficially resembles psychology.

Psychology : The science of human behaviour and cognitive (mental) processes.

Science : Science is a systematised body of knowledge gathered through carefully observing and measuring events.

Answers to SAQs.

1) Psyche and Logus; 2- a; 3- Behaviour and Cognitive / Mental processes;

4- c; 5- d; 6- Social / Behavioural ; 7- Understand, Describe, Predict and Control; 8- 1879; 9- Wundt; 10-Animal

1.8 SUGGESTED READINGS

Baron, R.A.(1999). *Essentials of Psychology* (2nd edition). USA: Allyn and Bacon.

Morgan, C. T., King, R. A., Weisz, J. R. & Schopler, J. (1986). *Introduction to Psychology* (7th edition). New Delhi: Tata McGraw-Hill

References

Coon, D. & Mitterer, J.O.(2008). Psychology: A Journey. (3rd edition) Delhi (India): Thomson Wadsworth.

Parameswaran, E.G. & Beena, C. (2002) An Invitation to Psychology. Hyderabad, (India): Neelkamal Publications Pvt. Ltd..

Bagga, Q. L. & Singh, A. (1990). Elemrnts of General Psychology. New Delhi: Arya Book Depot.

Baron, R.A.(1999). Essentials of Psychology (2nd edition). USA: Allyn & Bacon.

Beyer,B. K. (1995). Critical thinking. Bloomington, IN: Phi Delta Kappa Educational Foundation.

Bolles,R.C. (1993). The Story of Psychology. Portland:Brooks/Cole Pub Co.

Ciccarelli, S.K.& Meyer, G.E.(2006). Psychology. Delhi (India): Pearson Education, Inc.

Clark, K. E. & Miller, G. A. (eds.) (1970). Psychology. Englewood Cliffs, NJ: Prentice Hall.

Coon, D. & Mitterer, J.O. (2007). Introduction to Psychology: Gateways to Mind and Behaviour (11th edition). Delhi (India): Thomson Wadsworth.

Coon, D. & Mitterer, J.O.(2008). Psychology: A Journey. (3rd edition). Delhi (India): Thomson Wadsworth.

Dandapani, S. (2004). General Psychology. Hyderabad (India): Neelkamal Publications Pvt. Ltd..

Das,J.P.(19980. The Working Mind: An Introduction to Psychology, New Delhi, Sage Publication

Eysenck, M.W.(2004). Psychology: An International Perspective. Psychology Press.

Feldman, R.S.(2004). Understanding Psychology (6thedition), New Delhi (India): Tata McGraw Hill.

Hilgard, E. R., Atkinson, R. C., & Atkinson, R.L. (1975). Introduction to Psychology (6th edition). New Delhi: Oxford & IBH Publishing Co.

James, W. (1890). The Principles of Psychology. N.Y.:Holt.

Lahey, Benjamin B. (1998). Psychology: An Introduction. New Delhi; Tata McGraw-Hill Publishing Company Limited.

Morgan, C. T., King, R. A., Weisz, J. R. & Schopler, J. (1986). Introduction to Psychology (7th edition). New Delhi: Tata McGraw-Hill.

Nairne, J.S. (2003). Psychology: The Adaptive Mind (3rd edition). USA:Wadsworth.

Parameswaran, E.G. & Beena, C. (1988). Invitation to Psychology. New Delhi: Tata McGraw-Hill Publishing Company Limited.

Parameswaran, E.G. & Beena, C. (2002). An Invitation to Psychology. Hyderabad (India): Neelkamal Publications Pvt. Ltd.

Rathus, S.A. (2008). Psychology: Concepts & Connections. (9th edition). Canada: Wadsworth.

Rush, Harold M.F.(1972).The world of work and the behavioural sciences: A perspective and an overview. In Fred Luthans (Ed.). Contemporary readings in organisational behaviour. New York. McGraw-Hill Book Company.

Schick, T. & Vaughn, L.(2001). How to think about weird things: Critical thinking for a new age. New York: McGraw-Hill.

Tavris,C. & Warde,C. (1997). Psychology in Perspective (2nd Ed). New York: Addison Wesley Longman, Inc.

Woodworth, R. S. (1948). Contemporary Schools of Psychology. New York: Ronald.

UNIT 2 BRANCHES AND FIELDS OF PSYCHOLOGY

Structure

2.0 INTRODUCTION

We have come to know from unit 1 that psychology is the scientific study of behaviour and cognitive (mental) processes. We now, also know about the nature and characteristics of behaviour. However, behaviour is studied by other academic disciplines too. So, which aspects of behaviour are the concerns of psychology? Also, what is the relation of psychology with other academic disciplines?

You might have heard people using the terms 'psychiatrist', 'psychologist', 'counselor', etc. But, many of them perhaps, do not know the difference between them. Many of them also do not know, as to where do psychologists work. They think, psychologists mainly work in mental hospitals to treat abnormal/insane people, or may be teaching psychology at schools and colleges/universities. While certainly, these are the places where psychologists work, there are many other areas where knowledge of psychology is applied.

In this unit, you will find answer to the above questions. You will also come to know about the various branches of psychology and the wide range of fields where psychologists apply the principles of psychology, to solve a variety of human problems and/or improve the quality of life.

2.1 OBJECTIVES

On successful completion of this unit, you will be able to:

- Discuss the relation of Psychology to other academic disciplines;
- Describe the basic branches of Psychology;
- Explain various applied fields of Psychology;
- Identify the basic and the applied fields of Psychology;

- Distinguish between a Psychologist and a Psychiatrist; and
- Identify the places where psychologists work.

2.2 PSYCHOLOGY: ITS RELATION TO OTHER SCIENCES

You have already learnt from unit 1 that psychology as a behavioural science shares common characteristics with other physical and biological sciences. All sciences have practical application to deal with human problems and improve their quality of life. Engineering and technology have developed from the results of physics, chemistry and mathematics and have made life easier and comfortable. Similarly, medical sciences have contributed significantly to not only fight and control/eradicate many deadly diseases, but also cure/prevent many diseases. Psychologists have also developed a number of techniques to help people lead a fuller and happier life by promoting/enhancing their psychological health. Psychologists also cure and help in prevention of various psychological and emotional problems (behaviour disorders).

Sometimes, the world's problems such as climatic change, pollution, aftermath of natural disaster, man made disasters etc. are so widespread and serious that no one or two sciences can solve such problems. A group of scientists from different fields have to, therefore, come together and jointly handle such problems. This is known as 'transactionalism' (Rush,1972).

Due to the interaction of the results of different disciplines, new fields of knowledge have emerged. Examples of such disciplines are; biophysics, biochemistry, geophysics etc. Over the years, developments in one particular science, or sometimes more than one discipline, have influenced the developments in other sciences. Thus, no particular field of science can not be completely isolated from other fields of science, and different fields of scientific knowledge are quite closely related.

It is clear that though psychology has emerged as an independent field of scientific enquiry, nevertheless it has very close relationship with other sciences. In fact, the very emergence of psychology as a science, was possible because of developments in other sciences like genetics, physiology, neurology, medicine, physics, chemistry. sociology; anthropology, cybernetics and other sciences. Its methods of enquiry and analysis as well as application have all been influenced by developments in other subjects.

Of course, development in psychology have in turn, influenced the growth and development of other disciplines like sociology, anthropology, economics, political science, management etc. It is obvious that even though we can think of different fields of scientific knowledge, the fact is that these fields depend for their expansion on the findings of other disciplines. Perhaps, this will become clearer if we can examine in some detail the relationship of psychology with certain other sciences. For this purpose, we may group the other sciences in to the following categories: biological sciences, physical sciences, medical sciences and social sciences (Parameswaran and Beena, 2002)

2.3 BRANCHES AND FIELDS OF PSYCHOLOGY

All sciences have broadly, two branches . One, the basic or academic branch and the other, applied. The basic or academic branch is the result of an academic curiosity or a question e.g. Newton asked "Why does the apple fall on the ground?" which gave rise to the theory of 'gravity'. On the other hand, applied branch deals with solving problem by applying inputs from the basic/academic branch. However, this distinction is not rigid and beyond a point, both the branch converge. e.g. many theories of basic branch are applied, or have potential to be applied, to solve problems. Similarly, many applied branches have come up with new or supplementary theories, that have been included in the basic branch.

According to Parameswaran and Beena (1988), psychology may be broadly classified into general psychology and differential psychology. The former is concerned with the investigation of generalities and similarities in behaviour, especially among the normal adults while the later has been primarily concerned with the observation, measurement and explanation of individual differences. Gradually, these two broad divisions developed into further branches or divisions of general psychology and applied psychology.

2.3.1 Early Divisions

Psychology too, like other sciences, started with basic branches, which were classified as: experimental and non-experimental. The experimental branches started with *physiological*, *learning*, and *perception.* Many psychologists attempt to understand the fundamental causes of behaviour and their work may not be directly applied to solve practical problems. They are primarily engaged in basic research, and study such fundamental processes as learning, memory, thinking, sensation and perception, motivation, and emotion, by using experimental method. Thus, the *experimental psychologist* investigates how behaviour is modified and how people retain these modifications, the processing of information thinking, how human sensory systems work to allow people to experience what is going on around them, and the factors that urge them on and give direction to behaviour.

The non-experimental branch included *personality*, *social*, and *developmental*. However, many of these academic branches are having further sub branches, i.e.; developmental psychology has sub-branches like *child* psychology, *adolescence* psychology, and *gerontology*. Similarly, social psychology has an 'applied social psychology' branch and it has given rise to an applied field called 'organisational psychology'. Applied fields have also led to many theories, e.g.; application of theories of motivation to organisations has resulted in many work motivation theories. Thus, today, there are many branches of psychology, which are categorized under both basic and applied branches.

Many authors use the terms 'branch' and 'field' interchangeably. Area or branch seem to be broader terms which include both basic and applied aspects, whereas, field implies specific area, where expertise or specialised knowledge is required to solve problems. However, some authors use the term 'field' in a broad manner, e.g. 'the field of psychology' has many sub fields. Others use the term 'division' and 'sub-divisions' of psychology. Clear cut distinction is not obvious. Therefore, these terms are used interchangeably.

Now, let us look at some of the psychology's major branches/fields, as described by various authors (Baron, 1999; Coon, & Mitterer, 2008; Morgan et al., 1986; and Parameswaran & Beena, 2002).

2.3.2 Basic Fields

The basic fields in psychology are primarily concerned with identifying the causes of behaviour. Psychologists who work in these fields try to understand and describe the determinants of behaviour. The following are the basic fields:

Biopsychology: Studies the biological bases of behaviour. The intimate relationship between psychology and the biological sciences is quite obvious. All behaviour occurs through bodily processes. The brain plays a very important role in coordinating and organising the functions of the different organs of the body. In fact, it is the seat of all forms of complex behaviour. It is impossible to understand and explain behaviour without an understanding of the structure and functioning of the brain. Along with the brain, the entire nervous system plays a crucial role in behaviour. Hence, there is an intimate relationship between psychology and neurology, neurophysiology, neurochemistry and other branches of knowledge which are directly involved with the study of the nervous system, particularly the brain. Genetics, the branch of the biology which deals with the nature of inheritance of different qualities is also an important discipline from the point of view of psychology. Over the years, geneticists have carried out important researches, bringing out the role of heredity in determining behaviour. This has been particularly so in the case of abnormal behaviour like neurosis, mental retardation, psychosis etc. Studies on the role of heredity have also indicated the importance of the genes in determining the intelligence level.

In recent years, the role of chemical factors especially the hormones, secreted by endocrine glands have been shown to play an important role in behaviour. Emotional behaviour, temperament etc. are to a considerable extent, influenced by the hormones of the endocrine glands.

Cognitive Psychology: Studies human information processing abilities. Psychologists in this field study all aspects of cognition such as memory, thinking, problem solving, decision making, language, reasoning and so on.

Comparative Psychology: Studies and compares the behaviour of different species, especially animals. That is why some authors used to call this field as *animal psychology*. By studying animal behaviour, these psychologists gather important information which can be compared with and applied to human behaviour. For example, investigating how does the queen bee direct, control, and gets things done by the worker bees, may provide meaningful information about leadership.

Cultural Psychology: Studies the ways in which culture, subculture, and ethnic group membership affect behaviour. These psychologists do cross cultural research and compare behaviour of people in different nations.

Experimental Psychology: Investigates all aspects of psychological processes like perception, learning, and motivation. The major research method used by these psychologists include controlled experiments. But, as Morgan et al. (1986) put it, experimental method is also used by psychologists other than experimental

psychologists. For instance, social psychologists may do experiments to determine the effects of various group pressures and influences on a person's behaviour. So, in spite of its name, it is not the method that distinguishes experimental psychology from other sub-fields. Instead, experimental psychology is distinguished by what it studies—the fundamental processes of learning, and memory, thinking, sensation and perception, motivation, emotion, and the physiological or biological bases of behaviour.

Gender Psychology: Does research on differences between males and females, the acquisition of gender identity, and the role of gender throughout life.

Learning Psychology: Studies how and why learning occurs. These psychologists develop theories of learning and apply the laws and principles of learning to solve a variety of human problems.

Personality Psychology: Studies personality traits and dynamics. These psychologists develop theories of personality and tests for assessing personality traits. They also identify the causes of problems related to personality development.

Physiological Psychology: Physiological psychologists investigate the role of biochemical changes within our nervous systems and bodies in everything we do, sense, feel, or think. Mostly, they use experimental method and do basic research on the brain, nervous system, and other physical origins of behaviour. *Physiological Psychology* is not only a part of psychology, but also is considered to be part of the broader field called *neurobiology* which studies the nervous system and its functions.

As we know, *Physiological Psychology* is categorised under 'experimental' psychology. That is why some authors called this branch as '*experimental and Physiological Psychology*'. On the other hand, some authors have categorized '*experimental Psychology*' as a separate branch of psychology.

Sensation and Perception Psychology: Studies the sense organs and the process of perception. Psychologists working in this field, investigate the mechanisms of sensation and develop theories about how perception or misperception (illusion) occurs. They also study how do we perceive depth, movement, and individual differences in perception. Researches in this field has given rise to many laws and principles that help us understanding the ways we adjust to the visual world in a meaningful way.

2.3.3 Applied Fields

Social Psychology: Investigates human social behaviour, including attitudes, conformity, persuasion, prejudice, friendship, aggression, helping and so forth. Emphasises on all aspects of social behaviour such as how we think about and interact with others, how we influence and are influenced by others. For example, social psychologists study how we perceive others and how those perceptions affect our attitude and behaviour towards them.

This field has developed by the joint contribution of sociologies and social psychologists and their research interest overlaps. However, their focus differs in the sense that while the former are concerned primarily with social institutions, the later focus typically up on the individual.

The social psychologists who are working on the applied side of this field, have developed and standardised techniques to measure attitudes and opinions. Their survey research on political opinion, consumer attitudes and attitudes related to important social issues provide important information to politicians, business executives, and community leaders who benefit from these, while making decisions.

Self Assessment Questions

1) Experimental psychology is distinguished from other sub-fields, because:

   a) It studies the fundamental psychological processes

   b) The experimental method is used by these psychologists

2) The field that studies memory, thinking, problem solving etc. is known as;

   a) Comparative psychology b) Personality psychology c) Cognitive psychology

Answers

1. b) 2. c)

Clinical Psychology: Does psychotherapy; investigates clinical problems; develops methods of treatment. This field emphasises on the diagnosis, causes, and treatment of severe psychological disorders and emotional troubles.

Confusion between the fields of clinical psychology and psychiatry occurs because both clinical psychologists and psychiatrists provide psychotherapy. And both usually work together in many hospitals/clinics. That is why many people get confused regarding the difference between the two. Well, they belong to two different groups of professionals and differ in their educational background as well as ways of diagnosis and treatment.

Psychiatrists are physicians. After completing medical studies, they do Doctor of Medicine (M.D.) in psychiatry and specialise in the treatment of mental disorders, whereas, clinical psychologists hold a master's degree M.A/M.Sc and/ or a doctorate degree (Doctor of Philosophy [Ph.D] or Doctor of Psychology [Psy.D]) in clinical psychology.

Because of this difference in training, clinical psychologists who do not have medical training, cannot prescribe drugs to treat behaviour disorders. Also, whenever there is a possibility of medical disorder, a patient should be examined by a psychiatrist or other physician. Moreover, mostly, only a psychiatrist can refer a patient to a hospital for treatment and care. Clinical psychologists carry out research to find out better ways of diagnosing, treating, and preventing psychological disorders. They also rely heavily on standardised tests for identifying the causes of these disorders. They use psychotherapy, for which they are trained, for the treatment of mental disorders. But clinical psychologists are not authorised to prescribe drugs to treat behaviour disorders, as they do not have medical training. Also, they cannot refer a patient to a hospital, for care and treatment. Whenever there is a possibility of a medical disorder, a patient should be examined by a psychiatrist or other physician.

Community Psychology: Promotes community-wide mental health through research, prevention, education, and consultation. Community psychologists apply psychological principles, ideas, and points of view to help solve social problems and to help individuals in adapting to their work and living groups.

Some community psychologists are essentially clinical psychologists and they specially organise programmes to reach those people in the community, who have behavioural problems or who are likely to have such problems. These psychologists not only deal with mental health problems of community members but also attempt to promote their mental health.

Other community psychologists are more concerned with bringing ideas from the behavioural sciences to bear on community problems. They may be called the 'social-problem community psychologists'. Hostility among groups in the community, bad relations between the police and community members, or distress due to lack of employment opportunities, for example, might be problems on which a social-problem community psychologist would work. Such psychologists also, often work to encourage certain groups to participate in community decisions, to provide psychological information about effective and health-promoting child-rearing practices, or to advise school systems about how to make their curricula meet the needs of community members.

Consumer Psychology: Researches packaging, advertising, marketing methods, and characteristics of consumers. This field is an offshoot of social psychology.

Counseling Psychology: Does psychotherapy and personal counseling; researches emotional disturbances and counseling methods. This branch deals with helping people/individuals with personal problems including interpersonal relations, career choice, mild emotional troubles or behavioural problems such as over eating, slow learning or lack of concentration. Counseling psychologists assist individuals having specific problem like how to plan career, how to develop more effective interpersonal skills(e.g. communication skills). Now a days, there are many specialised fields within the counseling psychology and experts are working as marriage counselors, family counselors, school counselors etc.

The work of the counseling psychologist is quite similar to that of the clinical psychologist. The difference between them is that counseling psychologists generally work with people who have milder emotional and personal problems. They may use psychotherapy in an attempt to help with these problems. Counseling psychologists are often consulted by people with specific questions, such as a choice of career or educational program.

Educational Psychology: Investigates classroom dynamics, teaching styles, and learning; develops educational tests, evaluates educational programs. Investigates all aspects of educational process ranging from curriculum design to techniques of instruction to learning disabilities. This branch deals with broader problem of increasing the efficiency of learning in school by applying psychological knowledge about/of learning and motivation to the curriculum. Another specialised sub-field called *School Psychology* may be included in educational psychology.

Engineering Psychology: Does applied research on the design of machinery, computers, airplanes, automobiles, and so on, for business, industry, and the

military. Psychologists working in this field also write instruction manual in such a manner that can be understood by laypersons so that they can operate complex machinery and home appliances.

Forensic Psychology: Investigates problems of crime and crime prevention, rehabilitation programs, prisons, courtroom dynamics; selects candidates for police work. Forensic psychologists mostly work within the judicial system in such areas as assessing emotional and psychological state of under trials and victims, evaluation of rehabilitation programmes; eyewitness testimony and evidence; jury selection; and police training etc.

Industrial/Organisational Psychology: Investigates all aspects of behaviour in work setting ranging from selection and recruitment of employees, performance appraisal, work motivation to leadership. The first application of psychology to the problems of industries and organisations was selection and recruitment of employees by using intelligence, aptitude tests.

Now a days, a number of companies are using modern versions of such tests in their programmes for hiring and selection of employees. Specialists in this field also apply psychology to problems related to management and employee training, leadership and supervision, communication, motivation, inter- and intra-group conflict within the organisation. They organise on-the-job training programmes for improving work environments and human relations in organisations and work settings. These psychologists are sometimes called *personnel psychologists*.

Medical Psychology: Applies psychology to manage medical problems, such as the emotional impact of illness, self-screening for cancer, compliance in taking medicines. Job of these psychologists overlaps with part of health psychology.

School Psychology: These psychologists do psychological testing, referrals, emotional and vocational counseling of students; detect and treat learning disabilities, and help improve classroom learning. The job of school psychologists include diagnosing learning difficulties and trying to remedy them.

Educational psychology may include school psychology, but educational psychologists, as such, are usually involved with more general, less immediate problems. Educational psychologists are especially concerned with increasing the efficiency of learning in school by applying their psychological knowledge about learning and motivation to the curriculum.

Self Assessment Questions

1) 'Child Psychology' comprises a large part of:

   a) School psychology b) Counseling psychology

   c) Developmental psychology d) All of them

2) Psychologists, who deal with mild emotional troubles, work in the following field:

   a) Health psychology b) Child psychology c)) Counseling psychology

   d) All of them

Answers

1) c 2) b

2.3.4 Both Basic and Applied Fields

There are some fields which are categorised under both basic and applied fields, as per Feldman (Coon & Mitterer, 2007). These are described below.

Developmental Psychology: Conducts research on infant, child, adolescent, and adult development; does clinical work with disturbed children; acts as consultant to parents and schools. Emphasises on how people change physically, cognitively and socially over the entire life span. Developmental psychologists try to understand complex behaviours by studying their beginnings and the orderly ways in which they change with time. If we can trace the origin and developmental sequence of a certain behaviour, we will have a better understanding of it. Child psychology, the study of children's behaviour, consists of a large part of developmental psychology, because changes in behaviour occurs in an accelerated manner. But developmental changes also occur in adolescence, adulthood, and old age; and so the study of these changes is also a part of developmental psychology.

Developmental psychology has both research and applied aspects. For instance, a great deal of research has been done on the development of thinking in children. Progressive and systematic changes take place in their thinking during the first few years of life. On the applied side, developmental psychologists are often concerned with children who have behaviour problems or psychological disorders. The kinds of behaviours found in disturbed children are frequently quite different from the behaviours found in disturbed adults, and different methods are used to treat them.

Environmental Psychology: Studies the effects of urban noise, crowding, attitudes toward the environment, and human use of space. These psychologists act as consultants on environmental issues.

Health Psychology: Studies the relationship between behaviour and health; uses psychological principles to promote health and prevent illness.

Positive psychology: This is an emerging field of 21st century. This field is defined as the science of happiness and human strengths. Psychologists working in this field are concerned with the positive aspects of human nature such as hope, optimism, passion, love, gratitude, forgiveness, humility etc. They try to find out what makes a good life. The work of these psychologists overlaps with that of *humanistic psychologists* who have similar viewpoints.

Self Assessment Questions

1) To start with, 'Developmental psychology' was categorised under the following field:

   a) Physiological psychology b) Basic psychology c) Applied psychology

   d) Educational psychology

2) Emerging field of 21st century is:

   a) Health psychology b) Child psychology c) Counseling psychology

   d) All of them

Answers

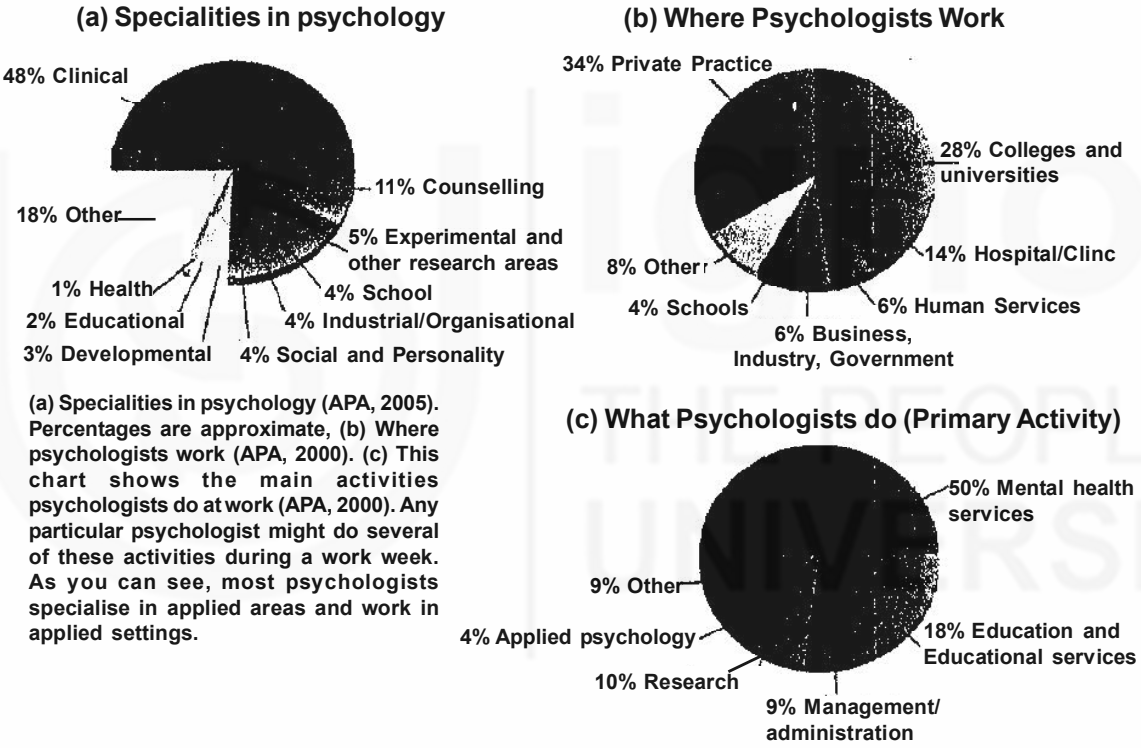
1) b 2) a

2.4 PSYCHOLOGISTS: WHAT DO THEY DO?

It is evident from the above that the work of psychologists are varied, as there are many specialties within the field. Psychologists are highly trained in the knowledge, methods, and theories of psychology. They usually have a master's degree or a doctorate. These degrees typically require several years of postgraduate training. Psychologists may teach, do research, give psychological tests, or serve as consultants to business, industry, government or the military. (Coon & Mitterer,2007).

In addition to their basic interest in research, many psychologists are engaged in applying this knowledge, to solve a variety of human problems.

Approximate percentages of psychologists working in different areas, as given by Coon and Mitterer(2008), referring APA (2000), are depicted in the figure given below:



(a) Specialities in psychology (APA, 2005). Percentages are approximate, (b) Where psychologists work (APA, 2000). (c) This chart shows the main activities psychologists do at work (APA, 2000). Any particular psychologist might do several of these activities during a work week. As you can see, most psychologists specialise in applied areas and work in applied settings.

2.5 LET US SUM UP

We have discussed various branches of psychology. Some of them fall under the basic fields, and others, under applied field. We have also seen how psychologists are working and applying the knowledge of psychology in a variety of situations, be it in business, industry, community, hospital, school, or society.

This unit provides you important information regarding whom (the expert who has specialised knowledge and training in a particular field) to consult for a particular problem.

2.6 UNIT END QUESTIONS

1) Discuss the relation of psychology to other academic disciplines.

2) What are the basic branches of psychology?

3) Explain various applied fields of psychology.

4) Identify the branches which fall under both basic and the applied fields of psychology.

5) Distinguish between a psychologist and a psychiatrist.

2.7 SUGGESTED READINGS

Baron, R.A.(1999). *Essentials of Psychology* (2nd edition). USA: Allyn and Bacon.

Coon, D. & Mitterer, J.O.(2008). *Psychology: A Journey*. (3rd edition) Delhi (India): Thomson Wadsworth.

Morgan, C. T., King, R. A., Weisz, J. R. & Schopler, J. (1986). *Introduction to Psychology* (7th edition). New Delhi: Tata McGraw-Hill

Parameswaran, E.G. & Beena, C. (2002) *An Invitation to Psychology*. Hyderabad, (India): Neelkamal Publications Pvt. Ltd.

References

Baron, R.A.(1999). Essentials of Psychology (2nd edition). USA: Allyn and Bacon.

Coon, D. & Mitterer, J.O.(2007). Introduction to Psychology: Gateways to Mind and Behaviour (11th edition) Delhi (India): Thomson Wadsworth.

Coon, D. & Mitterer, J.O.(2008). Psychology: A Journey. (3rd edition) Delhi (India): Thomson Wadsworth.

Morgan, C. T., King, R. A., Weisz, J. R. & Schopler, J. (1986). Introduction to Psychology (7th edition). New Delhi: Tata McGraw-Hill

Parameswaran, E.G. & Beena, C. (1988). Invitation to Psychology. New Delhi: Tata McGraw-Hill Publishing Company Limited.

Parameswaran, E.G. & Beena, C. (2002) An Invitation to Psychology. Hyderabad, (India): Neelkamal Publications Pvt. Ltd..

Rush, Harold M.F.(1972).The world of work and the behavioural sciences: A perspective behaviour. New York. McGraw-Hill Book Company.

UNIT 3 SYSTEMS AND THEORIES OF PSYCHOLOGY

Structure

3.0 INTRODUCTION

Many people get surprised when they hear that psychology is a science. They argue, if it is a science, why do students of psychology get Master of Arts (M.A.) degree rather than Master of Science (M.Sc) ? Moreover, it is not taught like physics, chemistry, or biology. Some people are also confused/puzzled regarding the subject matter of psychology. Most people think psychologists study 'mind' and they avoid facing/meeting a psychologist, thinking that he/she might read their mind by looking at them and come to know what all is going in their mind, which they may not like to share with anybody. Do psychologists really study 'mind', 'consciousness' or 'behaviour'? How do psychologists explain behaviour?

In this unit, you will find answers to such questions. First, we will present an overview of the development of psychology, as a science discipline, by narrating a brief historical background. Then we will discuss various viewpoints including early schools of thought, as well as the modern perspectives of psychology.

3.1 OBJECTIVES

On successful completion of this unit, you will be able to:

- Describe the contributions of ancient Greek philosophers to the development of Psychology as a science;
- Differentiate between 'structuralism' and 'functionalism';
- Identify the main characteristics of the school of 'behaviourism'?
- Describe the modern perspectives of psychology; and
- Explain any behaviour (s), using the relevant perspective (s) of psychology.

3.2 A HISTORICAL REVIEW OF THE DEVELOPMENT OF PSYCHOLOGY

Psychology has been recognised as an academic discipline since over 130 years. However, questions related to psychology have been asked thousands of years ago. Psychology has its roots in philosophy, which is the study of knowledge, reality and human nature. You already know how psychology is related to other sciences (physical and biological), from unit 1.2. Now, we will discuss briefly, the historical review, as to how other academic disciplines have influenced the development of psychology, as a scientific discipline.

Much before the Christian era, Greek philosophers studied the nature of man's *psyche* (mind/self/soul). More than 2000 years ago, the ancient Greek philosopher Socrates advised "Know thyself". He claimed that reliable self-knowledge could not be attained through our senses, because the senses do not exactly reflect reality, in the true sense. According to Socrates, because the senses provide imperfect knowledge, we should rely on processes such as rational thought and introspection (careful observation and examination of one's own thoughts and emotions), to achieve self-knowledge. He also stated that people are social creatures, who influence one another.

One of the main contributors among the ancient Greek philosophers was Aristotle. His concept of *empiricism* — the view that science could rationally treat only information gathered by the senses, has given rise to the empirical method, which is employed by all sciences. Other contributions of Aristotle include the following (see Rathus, 2008):

- Numbered the so-called five senses of vision, hearing, smell, taste, and touch.
- Explored the nature of cause and effect.
- Pointed out that people differed from other living things in their capacity for rational thought.
- Explained how the imagination and dreaming contained images that survived the stimulation that caused them.
- Outlined laws of *associationism* that have lain at the heart of learning theory.
- Wrote a text book on psychology, whose contents are found in modern text books of psychology.
- Argued that human behaviour, like the movements of the stars and the seas, is subject to rules and laws.
- Declared that people are motivated to seek pleasures and avoid pain.

Another ancient Greek philosopher, Democritus suggested that we could think of behaviour in terms of a body and a mind. Contemporary psychologists also hold that there is an interaction of biological and mental processes. According to Democritus, our behaviour is influenced by external stimulation. He was also one of the first to raise the question of whether there is free will or choice i.e., where do the influences of others end and our "real selves" begin?

Psychology has been influenced by not only philosophy, but also by a number of other sciences, as we have noted in Unit 1.2. These influences are reflected in various viewpoints of psychology.

3.3 SYSTEMS OF PSYCHOLOGY/VIEWPOINTS

We have also noted earlier (in Unit 1), how psychology has been defined as the study of 'soul' to 'mind' to 'consciousness'. The current definition of psychology emphasises on the study of behaviour and cognitive/mental processes. Thus, as Morgan et al. (1986) stated 'fundamental differences in viewpoints show up in the very definition of and ideas about what psychology should study and how. Such differences, and the arguments they spark can make psychology a lively field indeed'.

In the history of psychology, strong differences of opinion about what psychology should study and how it should do it, were represented by schools of psychology—groups of like-minded psychologists which formed around influential teachers who argued for one viewpoint or another (Morgan et al., 1986). Many of these earlier schools of thoughts have gone into the history. Today, many psychologists agree that psychology should study behaviour. Even those who want to study internal mental events, generally agree that this must begin with a look at behaviour. Though psychologists agree to look at behaviour, they may disagree about what they see and what it means. The moment psychologists try to make sense out of the complexities of behaviour, their differing perspectives can lead them to sharply differing views.

In this section, you will come to know about the earlier viewpoints, as well as, the current/modern perspectives of psychology.

3.3.1 Early Schools of Psychology

Formal ideas about behaviour and mind in western culture began with the classical Greek philosophers and have continued to this day as part of the fabric philosophy. Psychology, as a separate area of study, split away from philosophy a little over 130 years ago. The successes of the experimental method in the physical sciences encouraged some philosophers to think that mind and behaviour could be studied with scientific methods. As we know, the first psychological laboratory was set up by Wundt in 1879, at the University of Leipzig, Germany.

In the United States, the first formal psychology laboratory was established at John Hopkins University in 1883. Within a few years, most major universities had psychology laboratories and departments. The famous text book in psychology titled "The Principles of Psychology" was written by William James in 1890.

Wundt, James, and the then other psychologists thought of psychology as the study of mind. They attempted to find the laws relating to events in the physical world to a person's mental experience of those external events. For this, they did many experiments in the areas of imagery, memory, thinking, and emotion. However, in the first decades of the twentieth century, psychologists hold quite different views regarding the nature of mind and the best ways to study mind. About the same time, fundamental questions were raised about what should be studied in psychology:

Should psychology be the study of mind, should it study behaviour, or should both mind and behaviour be included? Different influential psychologists of the time held quite different views on the nature of mind and the proper subject

matter for psychology. Schools of thought formed around these leaders, as their students adopted their ideas. These schools of thought are known as the schools of psychology; they set the direction for much of the research on mind and behaviour in the early years of twentieth century (Morgan et al., 1986). Given below are the early schools of thought: Structuralism, Gestalt Psychology, Functionalism, Behaviourism, and Psychoanalysis.

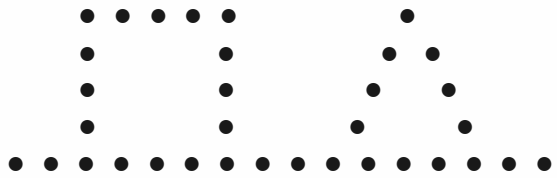
Structuralism: This early school, the structural school of psychology grew up around the ideas of Wilhelm Wundt, in Germany and was established at Cornell University in the United States by one of Wundt's students, Titchener. Structuralism emphasised that the subject matter of psychological research consists of images, thoughts, and feelings, which are the elements, forming the structure of consciousness.

The goal of the structuralists was to find the units, or elements, which make up the mind. They thought that as in Chemistry, a first step in the study of the mind should be a description of the basic, or elementary, units of sensation, image, and emotion which compose it. For instance, the structuralists did experiments to find the elementary sensations—such as red, cold, sweet and fragrant, for example—which provide, the basis of more complex mental experiences. The main method used by the structuralists to discover these elementary units of mind was *introspection*. Participants were trained to report as objectively as possible, what they experienced in connection with a certain stimulus, disregarding the meanings they had come to associate with that stimulus. A respondent might, for example, be presented with a colored light, a tone, or an odor and asked to describe it as minutely as possible.

These experiments have given us a great deal of information about the kinds of sensations people have, but other psychologists of the time, challenged the idea that the mind could be understood by finding its elements and the rules for combining them. Still others turned away from describing the structure of the mind to study how the mind functioned.

Gestalt Psychology: This school of Psychology was founded in Germany about 1912 by Max Wertheimer and his colleagues Kurt Koffka and Wolfgang Kohler. These pioneer psychologists felt that structuralists were wrong in thinking of the mind as being made up of elements. They maintained that the mind is not made up of a combination of simple elements.

The German word Gestalt means "form" or "configuration", and the Gestalt psychologists maintained that the mind should be thought of as resulting from the whole pattern of sensory activity and the relationships and organisations within this pattern. For instance, we recognise a tune when it is transposed to another key; the elements have changed, but the pattern of relationships has stayed the same. Or, to take yet another example, when you look at the dots in figure below, your mental experience is not just the dots, or elements, but of a square and a triangle sitting on a line.



It is the organisation of the dots and their relationships that determine the mental experience you have. Thus, the point made by the Gestalt psychologists in their opposition to structuralism was, mental experience depends on the patterning and organisation of elements and is not due simply to the compounding of elements. In simpler words, according to the Gestalt psychologists, the mind is best understood in terms of the ways elements are organised. Gestaltists were mainly concerned about the element of form or organisation which unifies behaviour, particularly perceptual behaviour.

Functionalism: As the name implies, functionalists were interested in studying the functions of mind and behaviour rather than limiting themselves to the description and analysis of mind. They proposed that psychology should focus on "what mind and behaviour do" (function of mind) and not on the "structure" of mind. Their interest was to study behaviour, as a dynamic, integrated process. Influenced by Darwin's ideas and theory of evolution, functionalists were, specifically, interested in the fact that mind and behaviour were *adaptive*, as they enable us to adjust to a changing environment. They did experiments on the ways in which learning, memory, problem solving and motivation help people and animals adapt to their environments.

Behaviourism: This school of psychology was propounded by John B. Watson, who was at Johns Hopkins University for many years. Watson rejected the idea that mind should be the subject of psychology, and instead, emphasised that psychology be restricted to the study of *behaviour* – the observable (or potentially observable) activities of people and animals. There are four important characteristics of behaviourism.

i) First, its focus on behaviour, as the proper subject matter of psychology.

ii) Second, it emphasised on conditioned responses (learned responses) as the elements or building blocks, of behaviour. Watson believed that complex human and animal behaviour is almost entirely made up of conditioned responses.

iii) A third closely related feature of behaviourism was its emphasis on learned rather than unlearned, behaviour. It denied the existence of any innate, or inborn, behavioural tendencies.

iv) Finally, the fourth characteristic of behaviourism was its focus on animal behaviour.

Watson argued that there are no essential differences between human and animal behaviour. He also believed that we can learn much about our own behaviour from the study of what animals do.

Psychoanalysis: It was founded by the famous psychiatrist Sigmund Freud, in Vienna, Austria. Psychoanalysis has had a significant impact on the thinking and theorising of many psychologists. Therefore, many authors have included psychoanalysis in the early schools of psychology, even if, strictly speaking, it is not a school of psychology.

Freud developed a theory of behaviour and mind (the psychoanalytic theory), on the basis of his practice with neurotic patients, which held that much of what we think and do is due to our urges, drives , and desires, which seek expressions in our thought and behaviour. It is important to note that, according to psychoanalytic

theory, these urges and drives are unconscious, i.e., they are hidden from our awareness. What is seen in behaviour and thought of people is the expression of these unconscious drives, urges, wishes, and desires. Thus, the concept of *unconscious motivation* is the key idea of psychoanalysis, which is still being utilised, as one of the explanations of behaviour.

The above schools of thought are part of the history of psychology. We will now look at the modern perspectives of psychology.

Self Assessment Questions

1) Darwin's theory influenced the following school of thought:

   a) Structuralism b) Functionalism c) Gestalt d) Behaviourism

2) "The whole is greater than the sum of the parts", is emphasised by the following school of thought:

   a) Structuralism, b) Functionalism, c) Gestalt, d) Behaviourism
   e) All of them

3) 'Behaviourism' emphasises on:

   a) Animal behaviour, b) Form, c) Innate responses

   d) Consciousness, e) Conditioned response, f) Configuration

Answers: 1. b 2. c 3. a and e

3.3.2 Modern Perspectives of Psychology

Though the early schools of psychology are more than 100 year old, two of them; *behaviourism* and *psychoanalysis,* are still surviving in modified forms, among the current psychological perspectives. Along with these two, some new perspectives have come up in the last 130 years or so. In order to understand and describe behaviour, psychologists now have a rich variety of viewpoints to choose from. The perspective taken, depends on how the psychologist is observing and interpreting a particular behaviour and also on what aspect of behaviour is being studied. Certain perspectives are more appropriate for some particular behaviours than others. Moreover, a particular behaviour may be described by one or more than one perspective.

Let us now look at the following two examples and attempt to understand how the current perspectives deal with these behavioural observations:

Some relatives have come to Pappu's (a 5-year-old boy) house, during the vacation. Pappu, his little sister Munni and their cousins were playing in the courtyard. Pappu snatched away the toy car from his sister.

Mr. Kumar, a 59-year-old man, realises that he is forgetting the recent events and important meetings.

The Behavioural Perspective: emphasises the role of learning in behaviour. The behaviour which is followed by reward or punishment is likely to increase or decrease, respectively. A psychologist with behavioural perspective might explain Pappu's behaviour that, he has learned to behave in this manner, because such behaviour (snatching toys from younger children) paid off in the past.

Another form of learning is observational learning, which is a complex process-far more complex than mere imitation-and plays an important role in many aspects of behaviour. A large body of research indicates that aggression may indeed be learned through observation. Given the fact that many children spend more time watching television, playing violent video games, and, more recently, surfing the Web than they do in any other single activity, the potential influence of such experience on behaviour seems worthy of careful attention (Baron, 2001). Studies show conclusively that if large groups of children watch a great deal of televised violence, they will be more prone to behave aggressively (Anderson et al., 2003; Bushman & Anderson,2001).

As far as Mr. Kumar's problem is concerned, this perspective would focus on an exact description of the changes in his behaviour. A psychologist with behavioural perspective might also attempt to teach behavioural skills to this person, so that he might learn to deal with the problems caused by his forgetfulness.

The Evolutionary and Biological Perspective: Psychologists are interested in the roles of evolution and heredity in behaviour and mental processes such as psychological disorders, criminal behaviour, and thinking. Generally speaking, our heredity provides a broad range of behavioural and mental possibilities. Modern *evolutionary* psychologists focus on the evolution of behaviour and mental processes. Charles Darwin argued that in the age-old struggle for existence, only the "fittest" (most adaptive) organisms manage to reach maturity and reproduce. Environmental factors interact with inherited factors to determine specific behaviour and mental processes (Rathus, 2008). From this perspective, Pappu is behaving in a manner that proves that he is strong and "fit"; he can take any thing he likes to, irrespective of whose belonging it is. Mr.Kumar's behaviour could also be explained from this perspective. Because memory is very crucial for survival, it is a matter of concern for him.

The Biological Perspective suggests that there are some biological factors—particularly, the functions of nervous and glandular systems, that influence human behaviour. Studies show that males are generally more aggressive than females (Maccoby & Jacklin, 1974); this may be related to male-female hormonal differences. However, the research on this, in humans, provides mixed results. So, it cannot be conclusively said that Pappu, being a male, is behaving aggressively.

A psychologist with biological perspective would try to understand Mr. Kumar's problem by linking this to brain problem. Due to the ageing process much wear and tear takes place in the organs of the body, including brain. May be, Mr. Kumar is in the early stages of Alzheimer's disease and the chemistry of the brain is at fault. Alzheimer's disease is a kind of primary degenerative dementia in which there is a cluster of specific degenerative brain changes due to unknown causes.

The Cognitive Perspective: Explains how behaviour is determined by the way we remember, think, perceive, make decisions, solve problems and comprehend our social environment etc. Cognition means perception of the world around us. It also refers to the processing of information which we receive through our senses. Our experience or mind is based on such processing of information.

A psychologist with this perspective would attempt to explain Pappu's behaviour in terms of his perception of Munni, as a weak little girl, who cannot fight back.

Another possible explanation could come from the social learning theory. He might have seen other little boys getting away with such aggression and may be modeling his behaviour on their example. Also, he perceives the situation and thinks, it is safe to behave the way he did, as no adult was likely to be present in the courtyard.

Memory is the most important focus of this perspective. So, Mr. Kumar's problem could be dealt with properly, by finding what exactly was forgotten and what was remembered, how the information processing had changed. A psychologist with this perspective would also attempt to help Mr. Kumar by giving him new ways of processing incoming information for storing in his memory and later, retrieving from his memory store.

The Socio-cultural Perspective: The profession of psychology focuses mainly on the individual and is committed to the dignity of the individual. However, many psychologists today believe we cannot understand people's behaviour and mental processes without reference to their diversity (Basic Behavioural Science Task Force, 1996b). Studying perspectives other than their own helps Psychologists understand the role of a culture's beliefs, values, and attitudes in behaviour and mental processes. It helps them perceive why people from diverse cultures behave and think in different ways, and how the science of psychology is enriched by addressing those differences (Denmark, 1998; Reid, 1994). This perspective addresses many of the ways in which people differ from one another. It studies the influences of ethnicity, gender, culture, and socio-economic status on behaviour and mental processes (Allen, 1993; Lewis-Fernandez & Kleinman, 1994). This perspective has not much scope to explain Pappu's behaviour. Mr.Kumar's forgetfulness is a matter of concern, as this is not accepted in any culture, particularly, if a person is in active service.

The Social Perspective: Attempts to explain behaviour in terms of social interaction and the setting in which such interaction takes place. If a criminal (such as a don or a terrorist leader) gets recognition, position or respect in a society or community, he/she is likely to be perceived as a role model by some individuals. Pappu might have behaved in this manner to show off and get recognition. Mr. Kumar's position in society and in his community is at stake, because of his memory problem.

The source of evidence for social learning of aggression is found in studies that reveal differences in violence, as a function of cultural and social variables. There is, for example, considerable evidence of systematic variation in the occurrence of violent acts across different national cultures. Residents of some countries also show a more pervasive tendency to think of violence as means of solving problems than persons living in other countries (Archer & McDaniel, 1995 [cited in Atkinson et al., 2000]).

Developmental Perspective: According to this perspective, behaviour is determined by the physical growth and maturity. Certain characteristic changes occur in people (i.e. the way they think), due to the process of maturation. Sometimes, young children commit crimes but not deliberately. This may be because of their cognitive *egocentrism*, which means that children have limited ability to think about how things look or feel to others. They do not have any intention to commit crimes in a planned way. Thus, Pappu being a 5-year-ld boy, he might not have realised how his behaviour might have hurt/has hurt his sister.

Even law also considers age as to whether a person will be convicted or not. In the context of legal and social definitions of crime and the criminal, Taft (1956) states that legally, a crime is an act made punishable by law. A criminal is one who has committed such a legally forbidden act. Yet there are other criteria which determine whether a person may be dealt with as a criminal. He has pointed out 5 such criteria as competent age, voluntary criminal act, criminal intent, degrees of intent, and injury to the state.

Regarding Mr. Kumar's memory problem, as we have already explained in the biological perspective, it might be due to aging process.

The Humanistic Perspective: Concerned with the person's sense of self. From this view point, a criminal's behaviour might be seen as a part of his/her search for personal competence, achievement, and self-esteem. People who commit violent crimes may perceive that by committing such acts, they are going to achieve some thing significant, such as doing justice to the society or for the cause of national security etc. In the case of Pappu, his behaviour has a little scope to be explained from this perspective.

Mr. Kumar's self-esteem is however, at stake, because he might be feeling embarrassed for his forgetfulness.

The Psychoanalytic Perspective: Comes from the psychodynamic perspective, which emphasises the role of unconscious feelings and impulses. According to Sigmund Freud, who propounded the psychoanalytic theory of personality, behaviour of human beings are largely guided by their feelings, emotions, instincts and desires which are unconscious. They are born with an aggressive drive. This innate motive gets expressed in action or fantasy, in destructiveness, war and sadism. According to this viewpoint, any impulse which is unacceptable, makes a person anxious, and then he/she uses what is called 'defense mechanism', to reduce anxiety. For example, when a person is angry at some higher authority or someone who is very powerful, the person cannot express one's anger openly and so, may displace that anger to someone, who is weaker. This is known as 'displacement', which is one of the defense mechanisms. Pappu might be angry with his parents or teachers, for some reasons, and his anger is probably displaced towards his sister (displacement).

Mr. Kumar might also be forgetting his appointment to someone, whom he dislikes (motivated forgetting).

Any one or more than one of the above psychological perspectives, may be used to explain behaviour .

Self Assessment Questions

1) The following schools of thought are still among the current psychological perspectives:

   a) Structuralism, b) Behaviourism, c) Gestalt, d) Functionalism, e) Psychoanalysis.

2) 'Cognitive egocentrism' has been referred in the following perspective of psychology:

   a) Biological, b) Behavioural, c) Cognitive, d) Developmental, e) Humanistic

Answers: 1) b and e 2) d

3.4 LET US SUM UP

We have discussed various schools of psychology. Some of them are earlier schools of thought (Structuralism, Gestalt, Functionalism, Behaviourism, and Psychoanalysis) and others are current psychological perspectives (The Behavioural, The Evolutionary and Biological, The Cognitive, The Sociocultural, The Social, The Developmental, The Humanistic and The Psychoanalytic).

This unit illustrates how any kind of behaviour can be explained, using one or more than one, psychological perspective.

3.5 UNIT END QUESTIONS

1) Discuss the contributions of ancient Greek philosophers to the development of Psychology as a science.
2) Compare and contrast 'structuralism' and 'functionalism'.
3) What are the main characteristics of the school of 'behaviourism'?
4) 'The whole is greater than the sum of its parts'; explain.
5) Briefly describe the modern perspectives of psychology.
6) Explain any behaviour (s), using the relevant perspective (s) of psychology, by giving examples.

3.6 SUGGESTED READINGS

Baron, Robert A.. (2001). *Psychology*. New Delhi: Prentice Hall of India

Morgan, C. T., King, R. A., Weisz, J. R. & Schopler, J. (1986). *Introduction to Psychology* (7th edition). New Delhi: Tata McGraw-Hill

Rathus, S.A. (2008). *Psychology: Concepts & Connections*. Thomson Wadsworth; New York.

References

Allen. L. (1993). Integrating a sociocultural perspective into the psychology curriculum. G. Stanley Hall lecture presented to the American Psychological Association, Toronto, Canada.

Anderson, C. A., Berkowitz, L., Donnerstein, E., Huesmann, I. R., et al. (2003).The influence of media violence on youth . *Psychological Science in the Public Interest*, 4(3), 81-110.

Atkinson, Rita L.; Atkinson, Richard C.; Smith, Edward E.; Bem, Darvl J.;& Nolen-

Hoeksema, Susan. (2000). *Hilgard's Introduction to psychology, (13th ed.)* : New York: Harcourt Inc.

Baron, Robert A.. (2001). *Psychology*. New Delhi: Prentice Hall of India.

Basic Behavioural Science Task Force of the National Advisory Mental Health Council (1996b). Basic behavioural science research for mental health: Perception, attention, learning, and memory. *American Psychologist*, 51, 722-731.

Bushman, B. J., & Anderson, C. A. (2001). Media violence and the American public. *American Psychologist*, 56 (6/7), 477-489.

Denmark, F. L (1998). Woman and Psychology: An International Perspective. *American Psychologist*, 53(4), 465-473.

Lewis-Fernandez, R. & Kleinman, A. (1994). Culture, Personality, and Psychopathology. *Journal of Abnormal Psychology*, 103, 67-71.

Maccoby,E.E. & Jacklin C.N. (1974). *The psychology of sex differences*. Stanford, CA: Stanford University Press.

Morgan, C. T., King, R. A., Weisz, J. R. & Schopler, J. (1986). *Introduction to Psychology (7th edition)*, New Delhi: Tata McGraw-Hill.

Rathus, S.A. (2008). *Psychology: Concepts & Connections*. Thomson Wadsworth; New York.

Reid, P.T. (1994). The real problem in the study of culture. *American Psychologist*, 49, 524-525.

Taft, D.R. (1956). *Criminology*. New York: The Macmillan Company.

UNIT 4 APPLICATION OF PSYCHOLOGY TO DIFFERENT DISCIPLINES

Structure

4.0 INTRODUCTION

We have earlier discussed, how psychology is related to, and influenced by other academic disciplines. You have also come to know how the applied fields of psychology are contributing to solve various day to day problems of living beings. Thus, you have learnt that psychology is making significant contribution in the fields of health, education, sports, community, society, organisations and so on.

Psychology is however, applied to yet certain other disciplines.. In this unit, you will come to know how psychology is related to such disciplines and some interdisciplinary fields, such as, environmental sciences, medical sciences, cognitive science etc.

4.1 OBJECTIVES

On successful completion of this unit, you will be able to:

- Explain the interrelationship of psychology with other academic disciplines;
- Describe the application of psychology to biological sciences; and
- Identify the areas of application of psychology to physical, medical and social sciences.

4.2 PSYCHOLOGY AND THE SOCIAL/ BEHAVIOURAL SCIENCES

Behaviour mostly takes place in the context of social setting and in relation to other people. Different social/behavioural scientists emphasise on one or the other aspects of social life. However, psychology extensively studies behaviour. As you already know, human behaviour is determined by many factors, and one can explain behaviour from various viewpoints. That is why interest of psychology overlaps with that of some other social/behavioural sciences**.** Thus the relevance of other social/behavioural sciences to psychology is obvious.

Parameswaran & Beena (2002) have described the relationship of psychology with behavioural sciences, biological sciences, physical sciences, medical sciences as well as, with some other disciplines. Given below is the description of psychology with some of the disciplines of social sciences.

Anthropology is supposed to be the mother of all social/behavioural sciences. It is interested in the study of culture, customs, ritual and practices of different distinct groups of people and understand the variations among them. Many anthropologists have contributed to our understanding of the various factors which explain the homogeneity or similarity of behaviour among members of a particular group and also how such groups differ from each other. Researches in anthropology have thrown light on why people of a particular community or even whole nation behave as they do. Psychology is enriched by such findings.

Psychological theories have also contributed to our understanding of the origin of culture, customs, religious practices etc. Psychoanalysts like Freud, Jung and others have made notable/significant contributions in this regard. Thus, there is a reciprocal relationship between anthropology and psychology. In fact, psychoanalytic anthropology and psychological anthropology attempt to explain the origin of all customs, cultures and practices on the basis of psychological factors.

Sociology is another major social science, which is mainly concerned with social organisations of societies into family groups, kinship groups, caste groups, nation groups etc. Sociologists study variations in these group formations among different societies and also try to analyse their roles in social life. It is a well known fact that these factors influence behaviour.

The structure of the family, caste groups, class groups etc. influence human behaviour. To this extent, psychologists must understand the roles of these factors in influencing behaviour. Sociological researches have contributed a lot to the field of psychology. This is particularly so in understanding the behaviour of groups of people and organisations and also in understanding the impact of groups, group standards, group expectations etc., on behaviour**.**

Social psychology**,** organisational psychology and group dynamics are branches of psychology, which are very closely connected with sociology. In fact, the first book in social psychology was written by a sociologist and a psychologist. The psychologists, while studying the development of behaviour from infancy onwards, have to analyze the role of society and social customs on the development of social behaviour. Sociologists like Durkheim, Parsons, Bales and others have made important contributions to the development of psychology.

Psychology is also concerned about how members of groups are influenced by other members, as well as by the group norms, values, rituals and practices of particular groups. It also emphasises on leadership and group formation etc., which can contribute to the field of sociology. Sociology has gained a lot from psychology.

Psychological theories have contributed considerably to explain the origin and survival of social customs and institutions. Theories of learning, perception and motivation, have contributed to the development of sociology. Sociology has also gained a lot from methods of research, developed by psychologists. Moreover, sociology has widely used measurement techniques, such as, attitude scales, interaction analysis etc., developed by psychologists.

4.2.1 Psychology and Economics

Economics deals with the economic organisation of society like income, expenditure, the role of economic institution etc. Much of human behaviour can be called economic behaviour. Economic theories have for long, considered the role of psychological factors in economic behaviour. Thus, Mill and Bentham advanced the theory of economic utilitarianism. Subsequently, the role of psychological factors in economic activities has attracted the attention of many thinkers. In recent years, McLelland and his associates have stressed the role of what is known as the *achievement motivation,* in economic behaviour.

On the other hand, the economic structure of society and economic factors like income, facilities etc. have been found to influence behaviour. Psychologists have been interested in the analysis of the influence of economic factors like income, on the development of behaviour. The role of poverty and economic deprivation on the development of behaviour has been extensively studied by. Psychologists. They speak of the proverbial 'middle class child' and his characteristic behaviour like ambitiousness, high anxiety etc. Thus, psychology is also closely related to economics.

4.2.2 Psychology and Political Science

Political science is another discipline, which has developed extensively in recent times. Political science deals with the political organisations, institutions and government practices. In recent years, there has been a very close interaction between political science and psychology. Attempts have been made to study and analyse the influence of the political system on human character and behaviour. Psychologists have done extensive research on what is known as 'authoritarianism' and have tried to explain this as a product of certain types of political systems.

Similarly, concepts like Machiavellianism, autocracy, etc., which are generally applied by the political scientists to large societies, have been made use of by psychologists in studying small organisations. In a classical experiment, Kurt Lewin and his followers studied autocratic groups, democratic groups, and others and compared their functioning.

Psychologists have also attempted to study the role of psychological factors in leadership. Thus, the lives of several political leaders have been analysed from a psychological angle to understand their behaviour and the factors which made

them successful leaders. Examples of such leaders whose lives have been analysed are Mahatma Gandhi, Martin Luther King, Adolph Hitler and others. Psychological analysis has also been made of different aspects of political behaviour like propaganda, voting behaviour, emergence of public opinion, mob mentality etc.

4.2.3 Psychology and Education

Education is, perhaps, one of the oldest sciences with which psychology has been intimately connected. The field of education is primarily concerned with the development of effective approaches and techniques for imparting knowledge and skills which would make the people personally successful and happy and socially productive. Needless to say, in striving to achieve these, educators have to take into account psychological factors such as the nature of the learning process abilities of individuals, their needs and proper methods of teaching among other factors.

Psychologists have made extensive contributions by developing a wide variety of tests which help the educator to measure the abilities of pupils, their inclinations, and choose the proper educational levels and situations. Psychological theories of motivation have contributed to work out techniques of motivating students for improving their learning. Researchers in the psychology of perception, learning and communication have contributed in evolving effective methods of teaching, preparation of useful teaching aids etc. Thus, one can see that the relationship between psychology and education is very intimate.

Self Assessment Questions

1) Different aspects of political behaviour include:

   a) propaganda, b) crowding, c) mob mentality,
   d) a& b, e) a & c, f) b & c

2) ..... is supposed to be the mother of all social/behavioural sciences.

3) Psychological theories of ..... have contributed to work out techniques of motivating students for improving their learning.

Answers: 1) e), 2) Anthropology, 3) Motivation

4.3 PSYCHOLOGY AND OTHER SCIENCES

You already know the tasks of psychologists. They work in a variety of basic and/or applied fields. Though psychology has emerged as a science; due to developments in other sciences, the developments in psychology have also influenced the growth and development of other disciplines like sociology, anthropology, economics, political science, management etc. Let us , now look at the relationship of psychology and other sciences, i.e., biological sciences, physical sciences and medical sciences, as described by Parameswaran and Beena (2002).

4.3.1 Psychology and the Biological Sciences

We have already discussed about the intimate relationship between psychology and the biological sciences. All behaviour occurs through bodily processes. Hence, psychology, which is the science of behaviour, is naturally dependent on other sciences which deal with the nature of the human body, the organs of the body and their functioning. Sensations, perceptions and all forms of behaviour originate as physical or physiological reactions and often culminate in muscular actions and glandular secretions. We have earlier discussed how the brain plays a very important role in coordinating and organising the functions of the different organs of the body. Along with the brain, the entire nervous system plays a crucial role in behaviour. Hence, there is an intimate relationship between psychology and *neurology*, *neurophysiology*, *neurochemistry* and other branches of knowledge which are directly involved with the study of the nervous system, particularly the brain. The important role of *genetics*, another branch of the biology which deals with the nature of inheritance of different qualities in determining behaviour, is well known.

According to Darwin, species change via a process of natural selection. Studies of selective breeding support this view. Characteristics are passed on from one generation to the next via genes. Genetic factors influence individual differences in intelligence, personality, and mental disorder (Eysenck, 2004). *Evolutionary psychology*, an emerging field in the 21st century, is an approach that explains behaviour and the development of the mind in terms of their function and adaptiveness.

It is a new theoretical approach that incorporates many of these ideas of *behavioural genetics*. Behavioural genetics is an approach to understanding the causes of behaviour that uses the degree of relatedness among different relatives to assess the role of genetic factors. The essence of evolutionary psychology, as pointed out by Buss (1999, p.3) and cited by Eysenck (2004) is as follows:

Evolutionary psychology focuses on four key questions: (1) Why is the mind designed the way it is? ... (2) How is the human mind designed?—what are its mechanisms or component parts, and how are they organised? (3) What are the functions of component parts and their organised structure—that is, what is the mind designed to do? (4) How does input from the current environment, especially the social environment, interact with the design of the human mind to produce human behaviour?

It could be argued that Buss's definition of evolutionary psychology is too broad, and is applicable to most approaches to psychology (David Carey, personal communication).

Pinker (1997, p. 23) addressed the issue of the historical origins of evolutionary psychology, arguing as follows:

Evolutionary psychology brings together two scientific revolutions. One is the cognitive revolution of the 1950s and 1960s, which explains the mechanics of thought and emotion in terms of information and computation. The other is the revolution in evolutionary biology of the 1960s and 1970s, which explains the complex adaptive design of living things in terms of selection among replicators (animals that reproduce).

The evolutionary process has resulted in species of animals that are structurally and behaviourally adapted to the environment, in which they live. Animals have evolved species typical behaviours to adapt to their environments. Evolutionary processes are also said to have produced brains that are specialised so that certain associations and responses are learned readily. Certain species are thus said to be ready, or predisposed, to learn some things easily; and such responses are often called *prepared behaviours*. Other responses are almost impossible for some species to learn; these are known as *contra prepared behaviours*. A third class of behaviours, the *unprepared behaviours*, can be acquired, but only when learning procedures are applied (Seligman, 1970)

Studies in the areas of health psychology and clinical psychology suggest how psychology also affects the physiological and biological processes. For example, *placebo effect* (changes in behaviour due to expectations that a drug or other treatment will have some effect) can be powerful. A *placebo* is a fake pill or injection. Inert substances such as sugar pills and saline (saltwater) injections are common placebos. Thus, if a placebo has any effect, it must be based on suggestion, rather than chemistry (Moerman, 2002). According to Kirsch & Lynn (1999), a saline injection is 70 percent as effective as morphine, in reducing pain. That is why doctors sometimes prescribe placebos. Placebos have been shown to affect pain, anxiety, depression, alertness, tension, sexual arousal, craving for alcohol, and many other processes.

Research also indicates that, in addition to exercises, there are some reliable, drug free ways of relaxing, when you are under stress. Meditation is one of the most effective ways to relax (Deckro et al., 2002). But be aware that listening to music, taking nature walks, enjoying hobbies and the like can be meditation of sorts. Anything that reliably interrupts upsetting thoughts and promotes relaxation, can be helpful. Also, Vipassana meditation(A Buddhist technique) has many beneficial effects including reduction/tolerance of pain.

It is also possible to relax systematically, completely, and by choice by a method called progressive relaxation. It is a method for producing deep relaxation of all parts of the body. Yet another technique called guided imagery can also be used for relaxation. In this technique, people visualise images that are calming, relaxing or beneficial in other ways.

Research shows that about 94% of diseases have psychological origin. These psychosomatic diseases (Asthma, ulcers, even cancers) can be cured by application of psychology. It has also been reported by many studies that optimistic outlook and positive thinking help patients in speedy recovery.

Thus, knowledge of psychology, such as perception, thinking, motivation, personality etc., can be applied by professionals like doctors, psychiatrists and counselors.

4.3.2 Psychology and the Physical Sciences

Physical sciences like physics and chemistry have also influenced the development of psychology. In fact, early experiments in psychology were very much modeled after and inspired by experiments in physics. Psychophysics appeared as an area of research in psychology due to the interaction between psychology and physics. The outstanding British thinker, John Stuart Mill suggested that psychology should

be a type of mental chemistry. From the early Greek period onwards researchers have tried to investigate and establish the chemical basis of human behaviour. Psychology has been influenced by the developments in physics like the work of Ehrenfels in acoustics. In fact, *gestalt psychology* (one of the early schools of psychology), was primarily/mainly inspired by this work. The developments in quantum-physics, magnetic field theories etc., have also revolutionalised psychological thinking. More recently, engineering sciences, particularly cybernetics and information theory have also influenced psychology. These developments have led to development of modern computers. Today, attempts are being made by psychologists to draw analogies between computers and human behaviour, particularly in areas like thinking, memory, learning, decision making etc. Thus, psychology is very closely related to physical sciences.

4.3.3 Psychology and the Medical Sciences

Medical sciences attempt to find out the causes of disfunctioning or malfunctioning of the body system. In fact, medical sciences are a branch of biological sciences. Advances in the medical sciences have resulted in a considerable amount of knowledge about the structure and function of the brain, the nervous system and the endocrine glands, which are crucial to the study of behaviour.

Medical sciences have contributed significantly to the understanding of abnormal behaviour. Actually, many of the leading thinkers in psychology such as Freud, Jung, Adler, Horney, Rogers, McDougall, Goldstein and some others were originally medical persons. They have contributed a lot to the understanding and treatment of human behaviour, as they were not only interested in treating physical diseases but also in dealing with psychological abnormalities. The development of the fields of abnormal/ clinical psychology as well as the psychodynamic approach to personality is due to the contribution of medical sciences.

While interacting with mentally ill and emotionally troubled people, these medical doctors developed useful insights to human behaviour.

Self Assessment Questions

1) ..... psychology, an emerging field in the 21st century, is an approach that explains behaviour and the development of the mind in terms of their function and adaptiveness.
2) A ..... is a fake pill or injection.
3) In fact, medical sciences are a branch of ..... sciences.

Answers: 1) Evolutionary, 2) placebo, 3) biological

4.4 PSYCHOLOGY AND SOME OTHER DISCIPLINES

We have so far examined the relationship between psychology and different groups of sciences. But psychology is connected not only with the sciences but also with other disciplines which are not generally regarded as sciences. For example, the relationship between psychology and philosophy is well known. Modern psychology grew out of philosophy and philosophers have always influenced theories in psychology. Even today, this is quite true.

Literature and art are the other fields of knowledge which are also related to psychology. In recent years, extensive investigations have been made in to the role of psychological factors in the production of literary pieces and works of art. Freud, Jung and several outstanding psychologists have tried to analyse the role of psychological factors like ego, motivation and personality in literary and artistic conditions.

Architecture is yet another field which has begun to take in to account psychological factors in designing buildings, town planning etc. One may therefore, say that the science of psychology as a very intimate relationship with almost every other discipline. This is naturally so because psychology is the basic science which is directly concerned with the study of human behaviour and evolving of techniques and strategies to improve human behaviour. Most other disciplines are also concerned with human behaviour or products of human behaviour directly or indirectly. Hence, this intimate connection of psychology with other fields of knowledge, is only natural.

You may be wondering that if psychology is so intimately related to other branches of knowledge and it has borrowed extensively from developments in other sciences, can we regard psychology as an independent discipline? The answer to this is strongly in the affirmative. While psychology might have leaned very heavily on discoveries and developments in other fields, it has an identity of its own. While other disciplines may be concerned with different aspects of behaviour, psychology alone is concerned with behaviour in totality. Further, if it has borrowed from other subjects, it has also contributed as much or more, to the growth and development of other subjects. In fact, this trend is steadily on the increase.

This is particularly so when it comes to the question of application of scientific knowledge to action programs. You can now appreciate the extensive and wide scope of psychology in a better light. It is no more a subject limited to philosophical speculations. It is now considered as a science and to be more exact, a psycho-socio-biological science. While it is related to other branches of knowledge, at the same time it is independent; perhaps, much more extensive in its scope and far more deeper in its implications. (Parameswaran and Beena, 2002).

We will now discuss the interrelationship of psychology to other fields like engineering, cognitive science, environmental sciences, law, and criminology.

4.4.1 Psychology and Engineering

Human factors engineering, as a branch of applied psychology, has made important contributions in the field of engineering. Industrial psychologists have helped in designing the right type of machines which would make would make it possible for the workers to do their best by eliminating unnecessary operations, minimizing strain and eliminating possibilities of confusion and oversight. This aspect of adjusting the job to the employee is known as *human engineering*. Human engineering has played a major role in developing ultra-comfortable automobiles, aircrafts, etc., in order to minimize stress strain and maximize efficiency and work output.

Every industry depends on its ability to sell its products, not only for its survival but also for its growth and expansion. Therefore, it is important to know the

needs, likes, dislikes, preferences and habits of people who buy these products. In a watch company, the product in-charge for a new range of watches which were believed to be exquisite, took informal feedback from their own friends and peers within the company. What they omitted to do was to check formally with consumers. They went ahead with production.

But, they had unsold inventory for many months because consumers rejected it, the chief reason being difficulty in reading time on those beautiful dials. Somewhere, in that quest to deliver cutting edge, perhaps, they had forgotten the basics. This highlights the importance of *consumer psychology*, yet another branch of psychology, which not only attempts to understand consumer needs and preferences through consumer surveys, but also contributes in the field of advertising. Effective advertisements help industries to influence consumers to buy their products. Psychologists have been helping in designing advertisements which would attract the attention of consumers and effectively convey the messages so that they are motivated to buy the products.

4.4.2 Psychology and Cognitive Sciences

Cognitive science is the interdisciplinary study of mind and intelligence, e.g., how information is represented and transformed in a brain or in a machine. It consists of multiple research disciplines, including psychology, artificial intelligence, philosophy, neuroscience, learning sciences, linguistics, anthropology, sociology, and education. It spans many levels of analysis, from low-level learning and decision mechanisms to high-level logic and planning; from neural circuitry to modular brain organisation. The term *cognitive science* was coined by Christopher Longuet-Higgins in his 1973 commentary on the Lighthill report, which concerned the then-current state of Artificial Intelligence research. In the same decade, the journal *Cognitive Science* and the Cognitive Science Society were founded. (http://en.wikipedia.org/wiki/Cognitive science).

The cognitive processes such as cognitive learning, memory, creative thinking, problem solving, decision making are being studied by psychologists and have been contributing to the field of cognitive science. For example, many modern organisations are using computers for routine kind of decision making.

4.4.3 Psychology and Environmental Sciences

An off shoot of human factors engineering, is a relatively recent field of psychology called *environmental psychology* . This is a broad area of enquiry and interdisciplinary in nature. The focus of investigation of environmental psychology is the interrelationship between the physical environment and human behaviour and experience(Holahan, 1982). Since its inception, environmental psychology has attracted scholars, researchers and practitioners from a variety of disciplines, including sociology, geography, anthropology, medicine, architecture and planning, as well as psychology (Craik, 1970; Prashanky and Altman, 1979). The study of human behaviour in physical settings requires the work of researchers in many social sciences as well as that of architects and planners responsible for the design for the design of human settings.

According to Holahan (1982), the label "*environmental psychology*" should be understood to describe the problem area of the field rather than a disciplinary restriction. Researchers in environmental psychology investigate wide range of

questions that involve psychological content—spatial behaviour patterns, mental images, environmental stress, attitude change. The researchers themselves, however, represent many disciplines including psychology. Research in environmental psychology is oriented toward both the resolution of practical problems and the formulation of new theory. Environmental psychologists have worked in such topics as environmental perception, environmental cognition, environmental attitudes, performance in learning and work environment, coping with environmental stress, coping with crowding, privacy and territoriality, personal space, affiliation and support in the urban environment. These have applications to environmental planning, for example, reducing urban noise, designing for the elderly, design strategies in dense environments, territoriality in institutional environments, humanizing the design of high-rise housing, citizen participation in urban planning etc.

4.4.4 Psychology, Law and Criminology

Forensic psychology is the intersection between psychology and the criminal justice system. It involves understanding criminal law in the relevant jurisdictions, in order to be able to interact appropriately with judges, attorneys and other legal professionals. An important aspect of forensic psychology is the ability to testify in court, reformulating psychological findings into the legal language of the courtroom, providing information to legal personnel in a way that can be understood. A forensic psychologist can be trained in clinical, social, organisational or any other branch of psychology. Generally, a forensic psychologist is designated as an expert in a particular jurisdiction. The number of jurisdictions in which a forensic psychologist qualifies as an expert, increases with experience and reputation.

Questions asked by the court of a forensic psychologist are generally not questions regarding psychology but are legal questions and the response must be in language the court understands. For example, a forensic psychologist is frequently appointed by the court to assess a defendant's competency to stand trial. The court also frequently appoints a forensic psychologist to assess the state of mind of the defendant at the time of the offense. This is referred to as an evaluation of the defendant's sanity or insanity (which relates to criminal responsibility) at the time of the offense. These are not primarily psychological questions but rather legal ones. Thus, a forensic psychologist must be able to translate psychological information into a legal framework.

Forensic psychologists provide sentencing recommendations, treatment recommendations, and any other information the judge requests, such as information regarding mitigating factors, assessment of future risk, and evaluation of witness credibility. Forensic psychology also involves training and evaluating police or other law enforcement personnel, providing law enforcement with criminal profiles and in other ways working with police departments. Forensic psychologists work both with the Public Defender, the States Attorney, and private attorneys. Forensic psychologists may also help with jury selection. (http://en.wikipedia.org/wiki/Cognitive_science).

A whole range of topics like criminal profiling to psychopathic personality to eye witness testimony, to mental and emotional states of victims/witnesses, to decision making process by the jury members and judges etc., are studied by

forensic psychologists. The findings of these researches have been very helpful for the legal system to do justice to the honest and punish the guilty.

Self Assessment Questions

1) Environmental psychology is an off shoot of .....

2) Forensic psychology is the intersection between ..... and the .....

3) Environmental psychology has attracted scholars, researchers and practitioners from a variety of disciplines, including sociology, ..., anthropology, ..., and architecture and planning

Answers: 1) human factors engineering, 2) psychology, criminal justice system, 3) geography, medicine

4.5 LET US SUM UP

Application of psychology to other disciplines cannot be overemphasised, even though, many disciplines have influenced the developments in psychology,

As we have seen in this unit, psychology has significantly contributed in many ways, to other disciplines, be they physical sciences, biological sciences, social/ behavioural sciences, medical sciences, environmental sciences, cognitive science or disciplines like engineering, law and criminology. Thus psychology, in spite of being an independent academic discipline, has close interrelationship with other disciplines.

4.6 UNIT END QUESTIONS

1) Explain the relationship of psychology with other academic disciplines.

2) Discuss the application of psychology to biological sciences.

3) How psychology is applied to physical sciences and medical sciences?

4) Briefly discuss the application of psychology to social sciences.

5) Describe some other disciplines, where psychology is applied.

4.7 SUGGESTED READINGS

Eysenck, M. W. (2004). *Psychology: An International Perspective*. New York: Psychology Press.

Morgan, C. T., King, R. A., Weisz, J. R. & Schopler, J. (1986). *Introduction to Psychology* (7th edition) New Delhi: Tata McGraw-Hill

Parameswaran, E.G. & Beena, C. (2002) *An Invitation to Psychology*. Hyderabad, (India): Neelkamal Publications Pvt. Ltd..

References

Buss, D. M. (1999). Evolutionary psychology: The new science of the mind. Boston: Allyn & Bacon.

Craik, K. H. (1970). Environmental psychology. In *New directions in psychology*, Vol. 4, New York: Holt, Rinehart & Winston.

Deckro, G. R., Ballinger, K.M., Hoyt, M., Wilcher, M., et al. (20020. The valuation of a mind/body intervention to reduce psychological distress and perceived stress in college students. *Journal of American College Health,* 50(6), 281-287.

Eysenck, M. W. (2004). Psychology: An International Perspective. New York: Psychology Press.

Holahan, Charles J. (1982). Environmental psychology. New York: Random House.

Kirsch, I. & Lynn, S.J. (1999).Automaticity in clinical psychology. *American Psychologist,* 54(7), 504-515.

Moerman, D.E. (2002). The meaning response and the ethics of avoiding placebos. *Evaluation & the Health Professions. Special Recent Advances in Placebo Research,* 25(4), 399-409.

Parameswaran, E.G. & Beena, C. (2002) An Invitation to Psychology (2nd edition), Hyderabad, (India): Neelkamal Publications Pvt. Ltd.

Pinker, S. (1997). How the mind works. New York: Norton.

Proshanky, H. M. & Altman, I. (1979). Overview of the field. In W. P. White (ed.) *Resources in environment and behaviour*. Washington D. C.: American Psychological Association.

Seligman, M. E. P. (1970). On the generality of the laws of learning. *Psychological Review*, 77, 406-418.

Web reference.

http://en.wikipedia.org/wiki/Cognitive_science

UNIT 1 THEORETICAL PERSPECTIVES OF DEVELOPMENT

Structure

1.0 INTRODUCTION

You must have wondered how human beings develop from union of tiny sperm cell and ovum into a complex human, able to perform myriads of work from as simple a task as lifting a bucket to solving complex puzzles about origin of universe. Answer lies in the process of development. In this unit we will study the meaning of development and various issues relating to the process of development. When did modern scientific study of human development start? What are the various theoretical approaches to development? There are many such questions which need answers and the present unit will try to answer most of the queries and enhance your understanding of human being's psychological functioning. You will be able to understand how we come to acquire abilities and skills that enable us to perform so many tasks separately and simultaneously. It is also expected to provide answers to some of the questions that puzzle your mind.

1.1 OBJECTIVES

After completing the study of this unit, you will be able to:

- Explain the meaning of the term development;
- Describe the issue of continuity and discontinuity in the process of development;
- Enumerate the dimensions or domains of development;

- Analyse the need of studying theories of human development; and
- Identify various theoretical approaches to the study of human development.

1.2 MEANING OF DEVELOPMENT

According to Elizabeth, B. Hurlock (1975) the term development implies a progressive series of changes that occur as a result of maturation and experience. As Van den Daele has pointed out, " development implies qualitative change". This means that development is just not adding inches to ones height or refining one's ability but it is a complex process which involves integration of many structures and functions.

Development involves two paradoxical processes in it, that is growth or evolution, and atrophy (decay) or involution. The two processes begin at the time of birth and end at death. In the early phases of life, growth predominates, as for example, the development of teeth, hair, increase in height etc., while atrophy or decay is dominant in the later years of life when we lose our teeth, there is loss of hair and sagging of muscles etc.

You must have noticed that when born, a baby is not able to survive without the help of parents or significant others. Gradually as time passes the baby first gains control of its head. Then come, gross movements of hands before being able to clasp an object in its hand. This happens because before being able to catch hold of an object the child must be able to lift its arm and move it in the desired direction. Clasping an object into one's hand requires use of finer muscles of fingers and palm. This can happen only when the child is able to master gross movements of hand. Thus development occurs in a series and involves integration of many functions.

1.3 CONTINUOUS VS. DISCONTINUOUS DEVELOPMENT

All of us know that infants, young children, adolescents and adults differ in their capacities and behaviour. How do we explain this? Actually it is here that the dichotomy of continuous and discontinuous development, arise. For example, a four year old boy may be as logical and organised in his thinking as an adult. He may be able to use simple rules of concept formation and categorisation of objects but may lack precision when the complexity of dimensions of objects increases or when the amount of information exceeds his limits of handling. Given this fact and definition of development in the above paragraph, development is a continuous process that consists of gradually adding more of the same type of skills that were there to begin with.

However, on the other hand the child's thinking, emotions and behaviour are quite different from that of an adult, which suggests that development is a discontinuous process marked by emergence of new ways of understanding and responding to the world. These new ways occur at specific intervals of age. Therefore, the child is not yet able to categorise objects or use complex rules of concept formation. However, modern developmental psychologists recognise that both continuous and discontinuous changes occur and that both are universal and unique features and are part of the individual development

1.4 DOMAINS OF DEVELOPMENT

In the preceding paragraphs we tried to make you understand the meaning of development and continuity and discontinuity of development. Now the question arises what are the various aspects of development? To answer this, you must know that the development takes place along three dimensions, viz., (i) Physical development (ii) Cognitive development (iii) Emotional and social development. Let us understand these a little more in detail.

Physical development: In this there are changes in body, changes in the functioning of various parts of the body, and there is development of the brain etc..

Cognitive development changes in higher mental processes and their capacities, e.g. memory, reasoning, concept formation, imagination and problem solving etc.

Emotional and social development— expression and control of emotions, ability to read others mood and emotions, ability to communicate with others in balanced and socially acceptable ways, interpersonal relationship etc.

1.5 DIFFERENT THEORETICAL PERSPECTIVES

All of us know that no two individuals behave in similar manner to one stimulus e.g. one person on seeing a beautiful rose may have the feeling of presenting it to girlfriend. Another person may wish to sale it and make money while still another person may admire it's beauty and fragrance. Now the question is how and why people become the way they are i.e. how they come to acquire different personalities and identities? A number of approaches were developed by psychologists to explain this phenomenon, some of which as follow:

1.5.1 Cognitive Approach

Cognitive approach to development was postulated by Swiss psychologist Jean Piaget (1896-1980). Piaget stated that children are not passive learners but they actively explore and manipulate the world around them. Children try to construct and make sense of the world around. Piaget thought that reinforcement alone is not sufficient for children to acquire knowledge. He centralised his theory in accordance with the biological concept of ***adaptation.*** Just like structures of the body, structures of the mind also develop to fit with external world. He believed that children differ from adults in their understanding of the world as for example, they lack ***object permanency,*** that is, when we take an object from a young child and hide it behind, the child would think that object has ceased to exist but adults know that it is there at the back in hiding.

Children's thinking is also devoid of adult logic as for example, children of 7 and 8 years of age assume that the quantity of liquid changes when poured in a differently shaped container.

Piaget further described that process of adaptation make use of two mechanisms- ***assimilation and accommodation.*** But as children grow they undertake corrective actions in order to strike a balance between internal structures and information they receive from outside world.

According to Piaget infants have certain skills in regard to objects in their environment. These skills are simple sensori-motor skills, and these direct the way in which the infant explores his or her environment and gain knowledge of the world. They also indulge in greater exploratory skills called **schemas**.

For example, an infant knows how to grab his favorite rattle and thrust it into his mouth. The child has the schema of the rattle within. When the child comes across some other object, say daddy's expensive watch, he easily learns to transfer his "grab and thrust" that also into his mouth. This now is another schema of the new object. This Piaget called **assimilation**, specifically assimilating a new object into an old schema.

When the infant comes across another object again — say a beach ball — he will try his old schema of grab and thrust. This of course works poorly with the new object. So the schema will be adapted to the new object. Perhaps, in this example, "squeeze and drool" would be an appropriate title for the new schema. This is called **accommodation**, specifically accomodating an old schema to a new object.

According to Piaget, they are directed at a balance between the structure of the mind and the environment, at a certain congruency between the two, that would indicate that you have a good (or at least good-enough) model of the universe. This ideal state he calls **equilibrium.**

Piaget described four stages of development

1) Sensorimotor stage (birth – 2 years),
2) Preoperational stage (2-7 years),
3) Concrete operational stage (7-11 years),
4) Formal operational stage (11 years and older)

1.5.2 Evolutionary

According to this theory, Darwin's evolutionary theory is applied to explain development. In this the main focus is on natural selection. It foucsses on genetic factors as well as environmental factors contributing to human development . According to this theory genetic and environmental mechanisms are the basic influence in the development of humans and according to Darwin this is a universal phenomenon. Those who are genetically strong will develop into a stronger human as compared to those who have inherited weak genes. Also the inherited factors woiuld work well only if there is a conducive environment and hence the possibility of the good gene individual not making up to the high level is present if the environment is not conducive. Darwin's theory of evolution involves the study of the genes and environmental mechanisms that underlie the universal development of social and cognitive competencies. The interaction of gene with the environment helps in the development of cognitive competencies in the individual and the evolved processes help adapt these cognitive competencies to the environmental demands. As well as societal demands.

It is well known that Konrad Lornez and Tinbergen studied the survival promoting behaviour, especially imprinting amongst the animal species. Imprinting is a behaviour seen amongst ducklings which immediately after birth stays very close to the mother and follows her wherever she goes. This way it receives survival support from the mother. This behaviour was termed as imprinting by the authors.

Imprinting takes place during specific period of development and if mother duck is not available to follow, ducklings follow any moving object that resembles the mother.

This concept of imprinting influenced the psychologists to consider similar developmental period sthat are critical for survival in humans also. The critical period in the human context refers to the limited time span during development when a child is biologically mature to acquire certain adaptive behaviours. However, for this the child needs a supportive and encouraging environment which would allow the child to explore and learn to interact with the environment. To cite an example, if a child is not provided the needed stimulating environment, even if the child has inherited the best of genes, it may not help much in adapting cognitively to the varied demands of environment. Even malnutrition and similar deficiencies may affect the child's mental and physical growth and development.

Imprinting in animals and birds can be adapted to the bhumans also in a very different way. It is a kind of an attachment. In fact taking the cue from imprinting, John Bowlby applied these concepts to understand human development, especially the attachment, the nearness to the mother figure or care giver, the fondling, touching and talking to the infant etc. He put forth that attachment behaviour of babies such as babbling, grasping etc. represents child's indication to parents to indulge in protective and fostering behaviour toward child which is a must for healthy development.

Based on many research findings, the researchers came to certain broad conclusions in regard to human development. These are presented below:

1) All evolutionarily-influenced characteristics develop, and this requires examining not only the functioning of these characteristics in adults but also their origin and the development from the fertilized egg to its mature form.

2) All evolved characteristics develop as a result of interaction between hereditarily acquired capabilities and factors with those of the environment over a period of time.

3) Development is governed by or dependent on both genetic and environmental factors.

4) Just the interaction of heredity and environment will not be sufficient for learning the complexities of human social community but also requires time as nothing can be learnt in a short period of time. The child has to grow up and in each stage of development different complexities arise and the child learns about these complexities or imbibe the same through the process of socialisation.

5) There are many aspects of childhood that are present have been learnt during the process of evolution. These form the base for adulthood.

6) In children, there are many characteristics which function as adaptive strategies.

7) It is also known that children are more flexible, have greater pliability and plasticity and have greater ability to adapt.

Eventhough the above are some of the important functions of heredity and environment and how humans develop, there is still a great need to comprehend the cognitive, emotional and social competencies as these change over time. For example we all know that children take a liking for some and hide away from some others. Do these preferences for individuals or faces have any survival value for the humans is an important question to be explored. Often one finds young infants are able to distinguish between familiar and unfamiliar persons, and the question arises as to whether this discrimination helps the children in their survival.

Psychologists who are specialising in Darwin's evolutionary theory and related concepts are also delving deep into the process of learning, how flexibility aspect in children is of value and how their easy adaptiveness to beahviour helps in many ways in the process of development.

1.5.3 Learning

The evolutionary theory gave emphasis on the interaction of the gentic factors with the environment. However learning theories considered development and behaviour as learned . According to them every behaviour is learned and so can be unlearned and one can also newly learn certain behaviours which are considered desirable. Learning perspective was advocated by John Watson who was interested to see if the findings of Pavlov (a Russian physiologist) could be applied to human learning.

As is well known Pavlov discovered that dogs salivate to food, a natural reflex response of the animal. But he also noticed that after some time the dog starts salivating on seeing the person responsible for providing food to the dog. Thus a neutral stimulus that is the food provider in course of time acquires the ability to elicit a reflex response. Pavlov termed it as classical conditioning. Taking clue from the findings of Pavlov, Watson experimented with an 11 month old little boy Albert. He presented Albert with a white furry rat. Whenever Albert moved to grab the rat a sharp loud noise was made that naturally frightened Albert, and stopped him from reaching the rat. Gradually Albert came to associate noise with rat and started fearing even the sight of rat.

Watson concluded that environment plays an important role in the development of many behaviours in humans. He was of the view that children's behaviour can be modified by carefully controlling stimulus-response associations**.** Development consists in a gradual increase in the number and strength of these associations.

Another learning perspective was put forward by B.F.Skinner whotermed his theory as operant conditioning.. Skinner postulated that children's behaviour can be shaped by matching with ***reinforcemen***t (reinforcement is anything that increases or decreases the likelihood of the occurrence of a behaviour. It can be in the form of reward or punishment). For example a child may be induced to do homework on daily basis by giving him chocolate every time he or she completes the homework. Further, chocolate can be substituted by praise. Similarly, a child can be desisted from telling lie by giving him physical punishment and physical punishment can be substituted by public humiliation.

Thus reward and punishment both act potently to shape behaviour. Skinner further postulated that behaviour can be shaped using four types of reinforcement

schedules. (i) fixed interval schedule (ii) variable interval schedule (iii) fixed ratio schedule and (iv) variable ratio schedule. These are explained below:

Fixed Interval Schedule: Here the reward or reinforcement in a positive form is given everytime a particular behaviour occurs. To give an example, you may decide to take out the child for a joy ride every Sunday if the child completes homework on time

Variable Interval Schedule: In this, e.g. you may reinforce the child's efforts to complete the homework by reinforcing or giving the child a reward on the first Sunday, 4th Sunday etc.

Fixed Ratio Schedule: In this the reward or reinforcement is given after a certain number of times the behaviour has occurred. As for example if the child continually completes the homework for five days in a week reinforcement in the form of reward will be given. Here every fifth response of the child is being reinforced.

Variable Ratio schedule: In this, there is no fixed pattern. Instead of every fifth response, at times the 4th response is reinforced and at another time the 7th response and at yet another time the 10th response is reinforced. Thus there is no question of the child eexpecting the reinforcement after 5th response etc., but will keep doing the homework in the hope of getting a reward at sometime. To take an example of an adult behaviour, one could consider gambling: Have you ever thought why people keep sticking to gambling machines? Answer is very simple, such machines are programmed on variable ratio schedule.

1.5.4 Endocrinology

Glands help regulate the internal environment of our body. There are two types of glands- endocrine glands and exocrine glands. While the former secrete hormones directly into the blood stream the latter that is the exocrine glands secretes hormones through ducts. The exocrine glands include the salivary glands, sweat glands and glands within the gastrointestinal tract. The exocrine glands are the "glands of external secretion."

On the other hand endocrine glands are those which secrete their hormones directly into the blood and are also known as ductless glands. Major endocrine glands are (i) Pituitary (ii) Adrenal (iii) Pineal and (iv) Thyroid gland. These are described below:

Pituitary gland: It is also known as master gland as it controls and regulates other glands through the release of various tropic hormones like Adrenocortico tropic hormone or ACTH(which regulates the functioning of adrenal gland). Another hormone Thyroid –Stimulating Hormone (TSH) regulates the functioning of thyroid gland. The Luteinizing hormone or LH stimulates formation of egg in the ovaries of women, while in males it promotes the development of testosterone, growth hormone or GH also known as somatotropic hormone. This affects protein metabolism thereby stimulating growth of cells and tissues of the entire body.

Adrenal gland is located above the kidneys. It has two parts (i) adrenal medulla and (ii) adrenal cortex. Adrenal medulla helps prepare the body for emergency functions while adrenal cortex affects metabolism of carbohydrates and salt in the body.

Pineal gland is located in the brain. It secretes melatonin, amine hormone. It prepares us for daily chores by activating our body.

Thyroid gland produces thyroxin which regulates production of insulin in our body. Insulin helps control glycogen level in our body. This gland also regulates formation of calcium in our bones.

Other noteworthy glands are Parathyroid and pancreas.

Self Assessment Questions

Tick mark True or False T/F

1) Classical conditioning was developed by Pavlov T/F
2) Operant conditioning was developed by Skinner T/F
3) Skinner mentioned four types of reinforcement schedules T/F
4) Reinforcement can be both negative and positive T/F

1.5.5 Psychodynamic

As is known, this approach was put forward by Sigmund Freud. He developed this perspective out of his observations of patients. According to him every individual passes through stages of psychosexual development and at each stage the person is faced with certain conflicts between biological drives and social expectations. How these conflicts at each stage are resolved determines the individual's personality in later years. The person's ability to learn, get along with others and the ability to adjust and cope with stress and anxiety, are all part of this stages of development and how the individual passes through the conflicts that are part of this stage.

Freud further laid down that these conflicts revolve around the basic sexual energy which he termed libido. Resolution of conflicts largely depended upon the way parents handle this basic sexual drive in children.

Freud opined that personality has three parts—Id, Ego and Superego. Id represents the unconscious and contains basic biological drives and needs. It is innate and devoid of rationality. Ego is rational and rooted in reality. It strives to establish balance between the irrational impulses and desires of Id. Superego is a learned, normative structure of personality and it strives to thwart the gratification of the needs expressed by the Id especially the ones that go against the norms of the society. The ego on its part tries to balance between the Id's desires, superego's restriction and the real life situation in the society.

Thus, ego ensures gratification of id through socially acceptable channels. For example, a person moving on the road sees deliciously tasty mangos, Id wants to eat those delicious mangos. But the person does not have money to buy mangos and satisfy Id. Id may insist on stealing them and achieve satisfaction but Superego warns that stealing is crime and sinful. Now Ego intervenes it may direct the person to go back, arrange for money and buy mangos to satisfy Id or it may try to arrive at some compromise between Id and superego through some other alternative.

According to Freud the relationship between Id, ego and superego determines the basic structure of personality.

1.5.6 Social-cognitive

Since the psychodynamic perspective could not explain human development satisfactorily and as it was also deterministic in that Freud said the personality develops fully by the time the individual is 5 years of age and after which there is very little change in the personality. Hence many more theories cam about to explain personality and social development one of which was the social learning theory which tried to explain development of children's social behaviour with the help of principles of conditioning and reinforcement. This led to the emergence of social learning theory by Bandura (1977), who postulated that children acquire new behaviour and responses by observing their parents and significant others. For example you might have often seen small boys and girls putting on shoes and sandals of their parents and trying to walk and behave like their parents. This way they acquire new responses and mould their behaviour after adults. Bandura called it modeling. Another type of social learning Bandura called was the vicarious learning in which one learns to act and not to act just by observing the consequences of behaviour of others. For example a child would not put his hand in running fan because he has seen other child doing so and hurting himself. However on the basis of later studies Bandura emphasised the role and importance of thinking and cognition in observational learning. Researches show that children's ability to listen, remember, and abstract general rules from complex sets of behaviour affects the process of imitation and learning. Therefore he revised his theory and named it social-cognitive theory**.** According to him as they grow up children become selective in what they imitate. Besides they also observe others indulging in self-blame and self-praise for their behaviours. Children also learn to appraise their behaviour through feedback about their actions. All this lead them to develop a feeling of self-efficacy about themselves. Self-efficacy is a belief in one's abilities and characteristics and it guides a person's response in a given situation.

Match the following psychologists with different perspectives of development:

Sigmund Freud	a) Learning perspective
Jean Piaget	b) Psychodynamic perspective
Skinner B.F	c) Social-cognitive perspective
Albert Bandura	d) Cognitive perspective
Vygotsky	e) Evolutionary perspective
John Bowlby	f) Socio-cultural perspective

1.5.7 Socio-cultural

You know that people living in different cultures have different cultural contexts. Different cultures have different child rearing practices. Now the question arises do different cultural contexts have differential impact upon development. Is this impact universally applicable or is this confined to environmental conditions? For example do American and Indian children differ as to when they start walking or learn rudiments of language because of cultural contexts ? Socio-cultural psychologists address themselves to relationship of cultural specific practices to child development. They are concerned with how culture i.e. values, beliefs, customs and traditions are transmitted to children. According to them social interactions between children and significant others in the society makes children

acquire the ways of thinking and behaving that make a society's culture. For example rituals of marriage, child birth etc. are conveyed to children by elders in the family. Children start receiving training at an early age. By the time they are 12 months old grandmothers train babies in the importance of sharing objects and close, intimate social bonds while in American or Indian society the concept of objects is just different.

Evolutionary psychologists further state that cognitive development is a socially mediated process and depends upon the support of elders as children master new tasks and skills. For example, learning of language helps children enter in greater social interaction with elders and expedites the process adaptive competencies. Interaction with elders in the society leads to continuous change in cognitive capacities of children and that children of different cultures vary in it. Different cultures place different emphasis on different tasks for children to learn. Hence children in every culture develop unique strengths.

1.6 LET US SUM UP

In the above paragraphs we tried to understand the meaning of development and what are the basic issues involved in the study of human development e.g. dichotomy of continuity and discontinuity of development, domains of development. We tried to make you understand these through examples. We also discussed different theories of development. Different psychologists have taken different approaches to explain the process of human development. We think that after going through all this you will develop a fair understanding of what the development is and able to express in your own words different aspects of development.

1.7 UNIT END QUESTIONS

1) What do you understand by the term development and what are the domains of development?

2) Differentiate between different approaches to development.

3) Discuss in detail the role of endocrine glands in human development.

4) Throw light upon the process of imitation and vicarious learning.

5) Do different cultures differently affect the process of development.

6) Do you think evolutionary process has anything to do with development? Comment.

7) Put forward the cognitive theoretical perspective of development.

8) What do you understand by the evolutionary perspective of development?

9) Discuss the psychodynamic perspective of development.

10) Elucidate the social cognitive and socio cultural perspective of development.

11) What do you understand by the term critical periods. Discuss the critical periods in perceptual development and the consequences thereof.

12) Discuss the development of language and executive functions in terms of cognitive development

13) What influences cognitive development? Is it heredity or environmental factors

14) Describe in detail the development of the brain and nervous system.

1.8 SUGGESTED READINGS

Hurlock, E.B. (1997). *Developmental Psychology A Life-Span Approach*. Tata McGraw Hill Publihsers, New Delhi

Richardson, K (2000). *Developmental Psychology*. How nature and Nurture interact. Lawrence Erlbaum Associates, Publishers, Mahwah, New Jersey

UNIT 2 BIOLOGIAL DEVELOPMENT (DEVELOPMENT OF THE BRAIN AND NERVOUS SYSTEM)

Structure

2.0 INTRODUCTION

In the previous unit we tried to understand the theoretical perspectives of development in order to understand the meaning of development and growth. Now that you have a fair idea of it, we will , in this unit , try to understand the development of human brain and nervous system. The field draws on both neuroscience and developmental biology to provide insight into the cellular and molecular mechanisms by which complex nervous systems develop. Defects in neural development can lead to cognitive, motor, and intellectual disability, as well as neurological disorders such as autism, Rett syndrome, and mental retardation. It is not possible to understand human behaviour without having firsthand knowledge of the brain and it's different structures and their functions. this unit tries to initiate you from the point of processes that generate, shape, and reshape the nervous system, from the earliest stages of embryogenesis to the final years of life.

2.1 OBJECTIVES

After going through this unit, you will be able to:

- Explain the development and stages of development of human brain;
- Describe cells, neurons, their structure and functions;
- Explain the nervous system and its parts;
- Enumerate the functions of different parts of the brain;
- Identify the differences between different parts of the brain; and
- Describe the relationship between brain and behaviour.

2.2 DEVELOPMENT OF THE BRAIN

From the point of view of neuroscientists, development of brain can be divided into five stages or five parts, which are (i) Myencephalon (ii) Metaencephalon (iii) Mesencephalon (iv) Diencephalon (v) Telencephalon

1) **Myencephalon:** This is the first and oldest part of the brain. It extends from spinal cord. It has within it Medulla oblongata. The main function of this structure is to take care of the autonomic activities of breathing, respiration etc.

2) **Metaencephalon:** This is the next part of the brain which is old in terms of evolution. It has within it pons and cerebellum. The main function of this structure of the brain is to maintain balance between different physical activities, as for example rhythm and coordination between the movements or hands and leges and other parts of the body. To cite an example is swimming which requires high levels of coordination, balance and rhythmic movement.

3) **Mesencephalo:** This is the third in the sequence of development of the brain parts and structure. The two divisions un der this include tectum and tegmentum. Tectum has structures termed as superior colliculi and inferior colliculi. As for their functions, the superior colliculi attends to the visual information and the inferior colliculi dealswith auditory information. The Tegmentum is inner part of the mesencephalon.

4) **Diencephalon:** This is one of the most important parts of the brain. It is small in structure and contains within it the thalamus and the hypothalamus. Thalamus is the structure through which all sensory information from all parts of body are transmitted to different organs and nit is called the great relay center. It contains hypothalamus which has as its main function to control homeostasis, emotions and motivations. It also has important role in sexual activities.

5) **Telencephalon:** This is the highest division of the brain and latest part to emerge on the scale of development. It encompasses forebrain, Limbic system and cereberal cortex. The forebrain is the largest part of the brain, most of which is made up of the cerebrum. The limbic system is a collective term referring to several brain parts, including the hippocampus and the amygdale. The limbic structures are important in the regulation of visceral motor activity and emotional expression. The hippocampus is important in the formation of memories and other higher functions. Amygdala is a structure whose function is to control autonomic, emotional and sexual behaviour.

Self Assessment Questions

1) State whether the following statements are true or false by putting a 'X' over the appropriate letter (T or F).

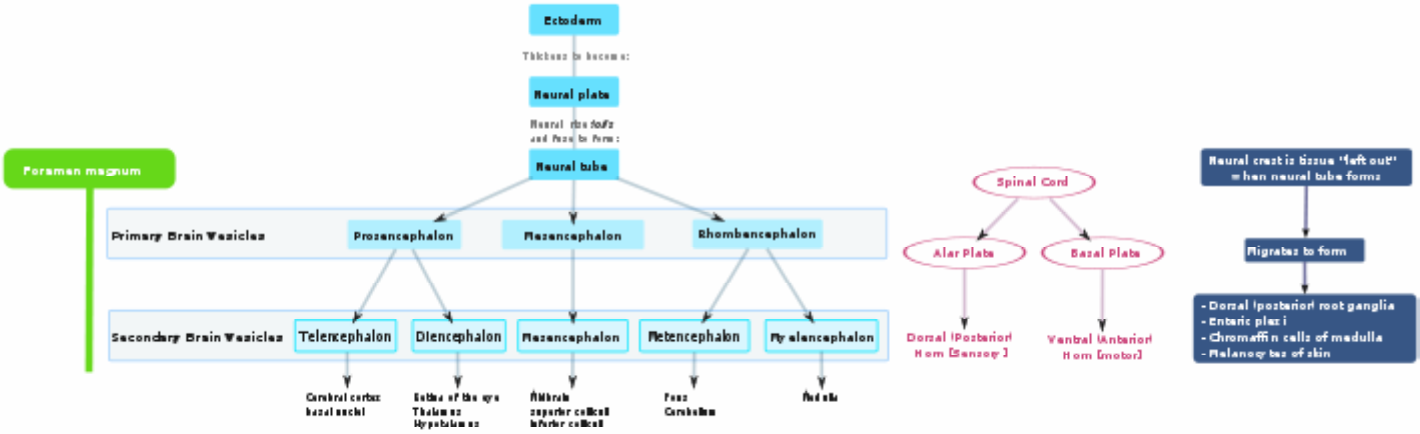
   i.) Last portion of brain to develop was telencephalon. (T/F)

   ii) Earliest part of brain on the scale of development is mylencephalon. (T/F)

   iii) Diencephalon developed before telencephalon. (T/F)

   iv.) Mesencephalon comes before diencephalon but after metencephalon. (T/F)

Schematic flowchart of human brain development is presented below the source of which is Wikipedia. It is clearly seen how the human brain develops and through which channels they moive etc.



Highly schematic flowchart of human brain development.
Source: (http://en.wikipedia.org/wiki/Neural_development_in_humans)

2.3 CELLS

Physiological psychologists divide cell into three categories namely (i) the receptor cells (ii) effector cells (iii) Glands. Let us describe each of these below:

2.3.1 Receptor Cells

These are cells which receive stimulation from specific type of stimulus. In a normal organism these are affected by four types of stimuli, viz., thermal, mechanical, chemical, and light.

Thermal receptors are in the skin and they are both heat and cold receptors. Mechanical receptors include cells for hearing, balance, and touch sensation.

Chemical receptors comprise of cells for smell, taste and those responsible for sensitivity to chemicals. These receptors make us aware of the changes taking place within the body and the environment outside.

2.3.2 Effector Cells

These include cells that makes the organism to give a response to stimulus. These have specific functions and structures and are of two kinds- *muscles and glands*. Muscles are created out of different types of individual cells and muscle fibers and are of three types a) smooth muscles, found in visceral organs like intestines, abdomen and blood vessels; b) striped muscels,also called skeletal muscles characterised with stripes are found in muscles of arms, legs etc. ; c) cardiac muscles, as the name suggests they are found in the heart. these mke heart work through expansion and contraction.

Glands are another main effectors. These help maintain internal environment of the body through secretion of chemical elements known as hormones. They are of two types:

a) endocrine glands, secreting hormones directly into the blood,

b) exocrine glands, their secretion goes out of body via ducts, therefore, are also called duct glands like sweat gland, tear glands.

2.4 NEURONS

Neuron is the smallest unit of nervous system. Before proceeding to discuss the main nervous system, we must, first understand neuron, its types, structure and functions. It is neuron which converts stimulation from different stimuli into electrical impulse. On the basis of function they are divided into:

i) Sensory neuron, responsible for carrying nerve impulse from sense organ to the brain and spinal cord

ii) Motor neuron, which are responsible to carry nerve impulse from brain and spinal cord to effector muscles so that organism makes response to stimulus,

iii) Association neuron, which are found only within the brain and spinal cord.

Now that you know neuron and its types, we will study the structure of neuron. Structurally a neuron is divided into three parts,

i) Dendrite

ii) Cell body

iii) Axon

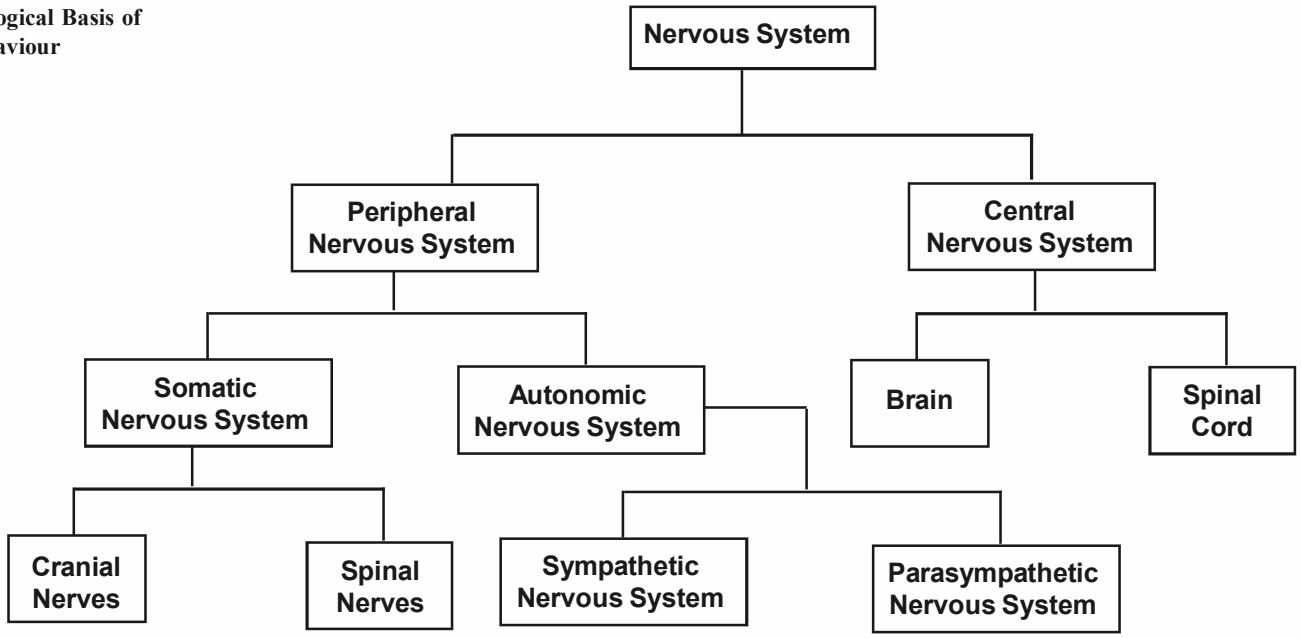
The Dendrite is a bushy structure. Its main function is to receive nerve impulses from other neurons and send to cell body. The cell body, also called as soma is the second main part of neuron. It is filled with a liquid called cytoplasm**.** In the center is nucleus. It sends nerve impulse to another neuron through axon and keeps the nerve cell alive and healthy. The axon it is a long structure having end buttons known as endbrush. It function to receive nerve impulse coming from cell body and sends it to the endbrush.

2.5 NERVE IMPULSE

You must be wondering that I told you about cell, neurons , their types, structures and functions, but exactly how the brain functions? how it receives information and how it sends information? answer to your question is nerve imulse. A nerve impulse is an electrical event. When a neuron is in stable or resting condition, inside of the neuron has negative electrical charge and outside is having positive charge. Whenever some stimulation takes place it disturbs this electrical balance so that inside becomes positive and outside is negative. At this moment an impulse is generated aimed at restoring this balance. In this process electrical disbalance runs throughout the memberane. This impulse is then transmitted to another neuron via axon. This way a chain of reaction occurs till it reaches the concerned part of the brain where the meaning of this impulse is deciphered and brain sends directives for activity to the concerned parts of the body.

2.6 NERVOUS SYSTEM

Nervous system is a complex structure. It controls all our activities and functions as a whole in an integrated manner. Given below is the flow chart of human nervous system.



2.6.1 Central Nervous System

This comprises of two parts i.e. brain and spinal cord. ***Spinal cord*** runs from cervics to the end of waist. It is filled with fluid which is covered with **meninges**. It has thirty one divisions from which pairs of spinal nerves comes out at regular intervals. It is a great conductor of nerve impulses. All the sensory information from various parts of body are received here and then sent to higher parts of the brain. All motor information from brain first enters spinal cord and then sent to different parts of body for action. Besides this, the spinal cord also functions as center of reflex actions. Given its importance it also called the **automatic machine.**

Brain is located in the bony skull. Within the skull, the brain is protected by three layers of tissues called **meninges**. Outer most layer is called ***dura matter*** and inner most layer is called ***pia matter.*** Between these two layers is a soft membrane called arechnoid. Arechnoid is filled with CSF (cerebro spinal fluid). Brain is composed of white and grey matter. White matter is called so because it is covered with a sheath known as ***mylin sheath***. From the view point of physiologists, the brain is divided into three parts, which is as given below.

A) Fore brain (thalamus, hypothalamus and cerebrum).

B) Mid brain (situated between forebrain and hind brain)

C) Hind brain (medulla, pons, cerebellum and reticular formation)

We will start our journey of brain from the back i.e**. Hind brain**, because from evolutionary point of view it is the earliest part to develop. The first and foremost structure of Hind brain is **medulla**. Medulla connects higher parts of the brain with spinal cord. It also includes a portion of reticular formation, called the vital center of the brain. It is responsible for autonomic activities of respiration, heart rate, blood pressure etc. Destruction of this part of the brain can lead to instant death of the organism.

Pons, another important part of Hind brain, is located above the medulla. It contains different types of sensory and motor neurons. It receives sensory

information from some parts of face and head and sensations of touch, pain, and temperature. It also regulates motor activities related to facial expressions, muscular activities, eye balls and jaw movements. Besides it also acts as connection center between higher and lower parts of brain.

Cerebellum, located at the back of Hind brain, is a complex structure. Its outer structure is composed of grey matter while inner structure is made up of white matter. In appearance it resembles cerebral cortex. Its main function is to coordinate motor activities. Destruction of cerebellum leads to lack of coordination as for example, a person can walk but his gait would be disorganised.

B) ***Midbrain*** encompasses brain above the pons and acts as a bridge between forebrain and Hind brain. It has two subdivisions called **tectum** and tegmentum**.** Tectum has a pair of structures called ***superior colliculi*** and ***inferior colliculi* .** Superior colliculi is roof and concerned with visual information while inferior colliculi is on the floor and deals with auditory information. Tegmentum lies below tectum. It has some important structures like rostral, end of reticular formation and nuclei controlling the activities of eye movements. Sensory impulses from lower parts to higher parts of brain and motor impulses from higher parts to lower parts of brain pass through it.

Starting from medulla in the Hind brain and extending to midbrain and hypothalamus of forebrain, a net of fibers pass by and is called reticular formation. Since this structure regulates and controls the activities of sleep, arousal and attention it is also called reticular activating system. It has two subsystems (i) ascending reticular system and (ii) descending reticular system. Ascending system sends sensory impulses to cerebral cortex while descending system receives motor impulses from brain and sends them to spinal cord. Destruction of this system sends an animal into sleep and may even into coma. It acts as filter as for example, when we are concentrating on some task we receive no other sensation except the ones on which we are focused. It happens because RAS does not filter away all other sensations and do not allow them to reach the brain.

A) ***Forebrain*****:** Now we will discuss the most important part of the brain i.e. forebrain. This portion of brain regulates and controls all higher and complex activities of human beings e.g. thinking, reasoning, memory etc.. Neuroscientists divide it into two parts-***telencephalon*** and ***diencephalon.*** Telencepahlon includes in it cerebral hemispheres, limbic system and basal ganglia. Diencephalon includes Thalamus and Hypothalamus. However psychologists have paid much attention on the structure and functions of thalamus and hypothalamus and cerebral hemispheres because almost all the activities are controlled and regulated by these parts.

Thalamus is an oval shaped structure is located right above the midbrain and between the two hemispheres. Thalamus contains three types of nuclei-sensory nuclei which receive sensory impulses relating to vision, hearing, pain, temperature, taste, and smell and sends them to appropriate parts of the cerebrum. Another type of nuclei receive nerve impulses from cerebellum, brain stem and reticular formation and send them to cerebrum. Third type of nuclei receive impulses from with in the thalamus and sends them to cerebrum.

Hypothalamus is a small structure located below the thalamus. It is very important and functions to regulate and control – biological motives of hunger, thirst and sex. It also controls and regulates homeostatic mechanism of our body as for example, when we feel hot it causes us to sweat thereby reducing our body temperature and when we feel cold it causes us to shiver thereby raising our body temperature. Hypothalamus also regulates the activities of autonomic nervous system and endocrine gland. It regulates the functioning of pituitary gland which affects the functioning of all other glands. Hypothalamus plays an important role in the regulation and control of emotions like anger, fear and aggression.

Basal ganglia includes caudet nuclei, putamen, globus pallidus and some part of amygdala. It plays an important role in motor control. Destruction of this portion may lead to Parkinson's disease.

Limbic system has five main parts – olfactory bulb, septal area, hippo-campus, amygdala and cingulate gyrus. Olfactory bulb receives smell sensations. Septal area, cingulated gyrus and amygdala play important role in the regulation of emotions. Hippcampus plays an important role in memory.

B) **The Cerebrum** largest portion of the brain is divided into two hemisphere by the longitudinal fissure. Both right and left hemispheres are composed of gray matter. In layman's language it is said that larger the gray matter the more intelligent a person will be. The two hemispheres are connected through corpus callosum, a bundle of nerve fibers. Each hemisphere has two deep fissures known as fissure of Rolando and central sulcus or lateral fissure. These fissures together divide each hemisphere into four parts or lobes:

- *Frontal lobe* is located in front of the central sulcus and above the lateral fissure. It plays important role in motor activities and higher mental processes. It has motor cortex, Broca's area and frontal association area.
- *Parietal lobe* located behind central sulcus and above the sylvius fissure it is primarily responsible for bodily sensations and knowledge of direction.
- *Temporal lobe* located below central sulcus in the temple it has Wernicke's area and temporal association area.
- *Occipital lobe* is located at the back of each hemisphere and it is the primary area for visual sensation.

2.6.2 Peripheral Nervous System

This comprises of all those neurons which lie outside the brain and spinal cord and connect these two with receptors, effectors and glands. It is divided into two parts i.e. somatic and autonomic nervous system.

- ***Somatic nervous system*** is primarily related to voluntary activities. Central nervous system sends impulses to voluntary muscles through somatic nervous system. It is further divided into cranial nerves and spinal nerves.

Cranial nerves originate from the bony skull and are found in pairs of twelve nerves. These are motor, sensory and association nerves. S***pinal nerves*** originate at regular intervals from the spinal cord and there are 31 pairs and are divided into five parts:

Spinal Nerves

Name	Number	Position
Servical	8	Neck
Thoracic	12	Chest
Lumbar	5	Coin/waist
Sacral	5	End of spinal column
Cocygeal	1	End of spinal column

- ***Autonomic nervous system***

This is rather important portion of peripheral nervous system. It comprises those neurons or nerve cells which are connected and regulate and control involuntary muscles, glands like kidneys, cardiac muscles, endocrine glands etc. Although connected with brain and spinal cord it acts in an independent manner. Autonomic nervous system is further subdivided into- **sympathetic nervous system** and **parasympathetic nervous system.**

Sympathetic system is located in the thoracic and lumbar region of spinal cord and is therefore known as thoraciclumbar system. It acts in integrated manner. It prepares our body for emergency situations e.g. when faced with danger it activates adrenal gland and pancreas thereby increasing the quantity of blood sugar in blood and also increases the rate of metabolism. All these changes in the body give us extra energy to meet the emergency situation.

Parasympathetic system is located in the cranial and sacral regions of the spinal cord hence called craniosacral system. It functions to restore our bodily processes to normalcy. In other words it is the opposite of sympathetic system. It lowers metabolic rate , heart beat and quantity of blood sugar in the blood.

Although the two systems are antagonistic they tend to act in a coordinated manner e.g. in situations of fear or anger adrenal gland, pancreas are activated by the sympathetic system to generate more energy. The parasympathetic system suspends digestive activity and other functional systems so that energy freed from these is available for use to meet the emergency situation.

2.7 LET US SUM UP

We have discussed the evolution and development of brain. We discussed neuron the smallest and basic unit of brain. Now we know how the neuron functions. We discussed how the brain receives information from environment. We also discussed broad outlines of the brain. While discussing the brain we acquainted ourselves with different parts of the brain like central nervous system, peripheral nervous system and their subdivisions. We also talked about how the different systems and subsystems of nervous system function and affect our body and behaviour as for example, our behaviour in emergency situation is different from normal situation and this is caused by activation of sympathetic and parasympathetic systems. Now we know what the absence or destruction of different parts of brain affect our body functioning and our behaviour in turn e.g. destruction of basal ganglia can lead to Parkinson's disease. Thus now you know all about the basics of brain and nervous system and can apply this knowledge with modification if necessary.

2.8 UNIT END QUESTIONS

1) Discuss the development of brain.
2) What are cells? and what are their different types?
3) Discuss the structure and functioning of neuron?
4) Write detailed description of central nervous system.
5) Discuss sympathetic and parasympathetic nervous system and how they function in integrated manner?

2.9 SUGGESTED READINGS

Inderbir Singh (2008). *Anatomy and Physiology for Nurses.* Jaypee Brothers, New Delhi

Marieb, Wilhelm (2010). *Essentials of Human Anatomy & Physiology*, Ninth Edition Companion Website Pearson Education. New York.

UNIT 3 COGNITIVE DEVELOPMENT

Structure

3.0 INTRODUCTION

Cognitive development aims at studying a child's development specifically information processing, conceptual resources, perceptual skill, language learning, and other aspects related to the development of the brain. Research in this field mainly has been focused on understanding how a child conceptualises the world. ***Jean Piaget*** was a major force in the founding of this field, and his theory is known as "theory of cognitive development".

Piaget Stages of Cognitive Development

The sensorimotor stage (Birth to 2 years)

The preoperational stage (Age 2 to 6)

The concrete operational stage (Age 7 to 11)

The formal operational stage (12yrs and up)

Cognitive Development contains empirical and theoretical work on the development of attention, language, executive functions, intelligence, heredity and environmental influences.

3.1 OBJECTIVES

After going through this unit, you should be able to:

- Explain the meaning of cognitive development;
- Describe cognitive development in your own words;
- Define and describe attention;
- Explain the role of attention in development;
- Discuss the role of language in human development;
- Identify executive functions;
- Define intelligence and IQ;
- Elucidate the measurement of intelligence; and
- Explain the importance of heredity and environment in development.

3.2 ATTENTION

Attention is the cognitive process of selectively concentrating on one aspect of the environment while ignoring other things. Attention has also been referred to as the allocation of processing resources. For example while watching TV our senses are glued to the screen and we do not pay attention to the surroundings and similarly we do not listen to a cell phone conversation while driving a car.

Attention has been a major area of investigation in the field of education, psychology and neuroscience. Often we find that young children remain involved in tasks for short interval of time, have difficulty in focusing on details, and are easily distracted. Researches conducted have focused on determining the source of the signals that generate attention, and their effects on the tuning of sensory neurons, and the relationship between attention and other cognitive processes like reasoning, memory and vigilance.

Attention may be differentiated according to its status as 'overt' versus 'covert.' Overt attention is the act of directing sense organs towards a stimulus source. Covert attention is the act of mentally focusing on one of several possible sensory stimuli. Covert attention is thought to be a neural process that enhances the signal.

3.2.1 Cognitive Inhibition

Attention depends on ***cognitive inhibition*** that is the ability to control distracting stimuli within and outside environment. Individuals capable of cognitive inhibition are able to keep their mind from other thoughts. They are also able to prevent unrelated stimuli from interfering with the task at hand. Capacity for cognitive inhibition increases with age and it develops markedly during middle childhood. It receives further impetus during adolescence. It is believed that frontal lobe is largely responsible for this.

3.2.2 Determinants of Attention

Nature of stimulus: By nature of stimulus we mean whether the stimulus is auditory or visual. Generally compared to auditory stimulus a visual stimulus attracts attention more easily. It happens because visual stimulus makes more

impressive projection upon the brain. For example, when passing by the side of a cinema hall we are more easily drawn to the poster on the wall than to the sound coming from within.

Change in stimulus: Any sudden change in the stimulus present before you is bound to attract your attention. For example, you are studying and table fen is running at your side, you will pay any attention to it if it stops suddenly, immediately your attention will be drawn toward it.

Novelty of stimulus: When a stimulus appears before us in a routine manner we stop paying attention to it for we get accustomed to it and it loses its novelty. But when it renews itself, our attention is immediately drawn to it. For Example, when one of your classmates who usually wears pant and shirt, suddenly comes in kurta pajama, your attention is suddenly attracted to him. Thus novelty of a stimulus is one factor that determines your attention.

Movement of a stimulus: Moving objects attract our attention more easily than static ones. Perhaps this is the reason that big emporiums and cinema halls decorate their hoardings with moving lights. Or when a motor cycle suddenly zooms past us our attention is drawn to it.

Duration of stimulus: We pay more attention to a stimulus that stays for longer duration before us than the one which is present for a short while. For example, if a photograph is placed before us for only a few seconds we may not pay attention to it but when it is there for minutes together we are more likely to pay attention to it.

Position of stimulus: Change in the position of stimulus also attracts our attention. Other things being equal, why is it that, a stimulus sometimes attracts our attention and sometimes not. The best example of this is the newspaper. If a heading is printed on the front page it attracts our attention but if it is on inside pages it does not attract our attention.

Isolation of stimulus: When a stimulus stands isolated from other stimulus it is more likely to draw our attention towards it. For example, if in a party you find a person who is standing isolated from others, he all of a sudden draws your attention. He compels you to think to why is he standing like this?

Intensity of stimulus: Intensity of stimulus is another factor that determines our attention. Greater the intensity of stimulus the more likely it is to attract our attention. For example, in a dark night our attention is immediately drawn toward the bright twinkling stars in the sky. Similarly, during day time we hardly pay attention to a tick tick sound of a watch but in the silence of night it is clearly audible to us.

Habit: Every person has some characteristic habits. Some people chew tobacco, some have smoking habit and still others have the habit of drinking. You will find that smokers easily pay attention to shops of cigarettes.

Need: Our biological needs also to some extent determine our attention. When hungry and moving though the market our attention is easily drawn by foodshops.

Expectation: Expectation also decides our attention. For example, if your father daily returns home in the evening at 7 P.M., you will immediately pay attention when the door opens at around this time.

3.2.3 Types of Attention

a) **Focused attention:** Being able to respond discretely to a specific object in one's environment is called focused attention. During the first year infants pay more attention to novel eye catching object and quickly orient to them.

b) **Sustained attention (vigilance):** Being able to maintain a focused response to an object is termed as sustained attention. During the second year child becomes capable of intentional , goal directed behaviour which in turn contributes to improvement in sustained attention. For example when a child is asked to put toys in the basket attention needs to be maintained to accomplish the task. Sustainability of attention increases with complexity of the task.

c) **Selective attention:** Being able to maintain a behavioural or cognitive set in the face of distracting or competing stimuli. Selectivity of attention improves markedly around 6 and 9 years of age. Children are able to pay deliberate attention to relevant aspects while ignoring other information.

Example: pick out numbers which are multiples of 3 from amongst many numbers.

d) **Alternating attention:** Being able to shift focus of attention between objects having different cognitive requirements. Example children of sixth grade in judging whether pairs of stimuli are the same or different. They quickly shift their basis of judgement form size to shape to color when asked to do so.

e) **Divided attention:** Ability to pay attention and respond simultaneously to multiple tasks or multiple task demands.

3.3 LANGUAGE

A **language** is a system of signs (indices, icons, symbols) for encoding and decoding information established through social conventions.

Some of the areas of the brain involved in language processing include Broca's area (Blue), Wernicke's area (Green), Supramarginal gyrus (Yellow), Angular gyrus (Orange), and Primary Auditory Cortex (Pink)

Human languages are usually referred to as natural languages. A common progression for natural languages is that they are considered to be first spoken and then written, and then an understanding and explanation of their grammar is attempted

Language is very important for the development of personality of a child. Development of language is closely related to an individual's physical, social and mental development. This is the reason a child is able to learn language only after attaining a certain level of physical maturity. For example, the child is able to pronounce some words clearly only after his vocal organs reach maturity.

3.3.1 Characteristics of Language

Language is acquired and the acquisition is influenced by the child's ability to make necessary improvements in his behaviour. Understanding of language comes

months before speaking. For example, the child expresses his happiness through smiles or laughing when he sees his mother calling him through a specific sound.

The first sound produced by a child is natural and undifferentiated called, ***"babbling***". A child first produces vowel sounds such as, "aa", "oo". After this he produces vowel-consonant mixed sounds like, "ma", "pa" etc.

Though individual differences are found in the development of language of children, yet the development of language in children follows a pattern as is given below:

Phase 1: In this phase the child utters incoherent sounds.

Phase 2: In this phase, the child uses some primary words.

Phase 3: In phase 3, the child develops power to make sense of meaning of words.

Phase 4: In this phase the child develops power to express ideas.

Phase 5: In this phase the child develops control over adult language.

3.3.2 Functions of Language

Children's activities relating to language are often self-centered in that the child talks to self and listens to self. Thus the child is a talker and a listener at the same time. For example, you might have noticed that while playing, very young children keep talking to themselves. They use language for asserting themselves and for attracting attention of others.

3.3.3 Language as Means of Socialisation

As the child begins to show signs of social consciousness the language the child speaks also matures. By the time the child is 7 or 8 years old the proficiency over language reaches a stage where it appears that the child has been adequately socialised. This mastery over language enables the child enter into interactions with others and the child receives the first lesson of cooperation and is compelled to think how the child is related to other persons in the society. This knowledge facilitates the child's personal and social adjustment.

As is well known, initial language of the child is characterised by self centeredness but with advancement in age he attains greater proficiency over language, is able to enter into meaningful dialogues with significant others in the environment , put queries, gives answers, discusses things, takes suggestion and also gives suggestions,etc. All these processes over a period of time makes the child more mature in terms of language and behaviour. According to Piaget language development in the context of socialisation passes through following stages:

Stage 1: Ability to communicate properly to listener as per demands of the occasion.

Stage 2: Ability to evaluate, criticize, condemn other's behaviour on some parameters.

Stage 3: Pray, threaten and order.

Stage 4: Ask questions to seek information.

Stage 5: Answer questions asked by others.

Stage 6: Ability to involve in courtesy conversation with others.

Stage 7: To imitate voices in the environment.

Self Assessment Questions

Tick mark the alternatives given against the statements given below :

1)	Attention is motor process.	T/F
2)	Attention involves focusing one aspect while ignoring others.	T/F
3)	Attention develops over a period of time.	T/F
4)	Language is not a system of signs.	T/F
5)	Language is an innate property of child.	T/F
6)	Language plays no role in socialisation.	T/F
7)	Language is acquired in phases.	T/F

3.4 EXECUTIVE FUNCTIONS

The executive system is a theorised cognitive system in psychology that controls and manages other cognitive processes. It is also referred to as the executive function. The executive functions are also known as supervisory attentional system, or cognitive control. The concept is used by psychologists to describe a loosely defined collection of brain processes which are responsible for planning, cognitive flexibility, abstract thinking, rule acquisition, initiating appropriate actions and inhibiting inappropriate actions, and selecting relevant sensory information

Hypothesized Role

The executive system plays vital role in handling novel situations outside the domain of some of our 'automatic' psychological processes that could be explained by the reproduction of learned schemas or set behaviours. Include the following:

A situation that demands planning and decision making

A situation which requires correction or troubleshooting

When the responses are not learned and some new actions are required.

Situations containing element of danger or are technically difficult.

Any situation which demands breaking of a habit and resisting temptation.

The executive functions are often invoked when responses automatically elicited by stimuli in the external environment have to be inhibited. For example let us suppose that your class teacher asks you to prepare a project on a topic that you know nothing about. What will you do? You will chalk out a plan as to how to proceed on this project.

To take another example, let us say you are attempting a lengthy question in mathematics and in the end when you compare your answer with the solution given at the end, you find that your answer is wrong. What do you do? Let me

tell you. You will go for a revision of the entire question to check to see where you need any correction and that too in which step.

One could take yet another example, let us say that you have the habit of driving gearless scooter. Let us say now you purchased motorbike with gears. You will drive it with great hesitation and caution till the time you master the combination and coordination of new responses brought in by the geared bike.

To cite another example, on being presented with a potentially rewarding stimulus, such as a tasty piece of chocolate cake, the automatic response might be to take a bite. However, where this behaviour conflicts with internal plans (such as having decided not to eat chocolate cake while on a diet), the executive functions might be engaged to inhibit this response.

Thus many of our responses get inhibited or changed due to many situations.

3.5 INTELLIGENCE

Intelligence is an umbrella term describing a property of the mind including related abilities, such as the capacities for abstract thought, reasoning, planning, problem solving, communication, and learning. Intelligence derives from the Latin verb *intellegere*. However, intelligence being rational or understanding (intelligence) is different from being "smart" (capable of adapting to the environment).

Intelligence has been defined variously by different psychologists which are given below:

Ability to adjust: initially it was assumed that a person's ability to adjust himself in his environment is intelligence .

Ability to learn: the faster an individual was able to learn a given task, the more intelligent he was assumed to be.

Abstract thinking: intelligence was thought of as an individual's capacity to think abstractly.

However, later on psychologists realised that all these definitions are lacking something in common. In other wordseach defginition is addressing only one aspect of intelligence and this was against common observation that intellectual behaviour includes much more than the above mentioned qualities. Thus Wechsler came out with a new definition of intelligence. He stated that "Intelligence is the aggregate or global capacity of the individual to act purposefully, to think rationally, and to deal effectively with his environment."

3.5.1 Types of Intelligence

Social intelligence: By social intelligence we mean the ability of a person to understand others and get along well with them. Such people enjoy good social relations due to higher social skills. Usually social intelligence is reflected in abundance among leaders.

Abstract intelligence: It refers to a person's ability understand verbal and mathematical signs and codes and is able to properly interpret them. Painters, artists, mathematicians often show higher levels of abstract thinking.

Concrete intelligence: Ability to understand concrete things/ objects, to use them deftly in different situations. Such type of intelligence is required in business and other professions

Robinson & Robinson defined intelligence as, " Intelligence refers to the whole class of cognitive behaviours which reflect an individual's capacity to solve problems with insight, to adapt himself to new situations, to think abstractly and to profit from his experiences."

3.5.2 Mental Age

Psychologists divide an individual's age in two parts, viz., Chronological Age i.e. age of a person form the time of his birth. And the other is Mental age, a concept propounded by Binet and Simon.

Tuckman defined Mental Age as, " a score that is determined by comparing a child's score with the average scores of his or her age-mates and with the score obtained by younger and older children in the norming group."

For example if a child with 6 years of chronological age gets success on an intelligence test meant for an 8 year old child, then his mental age would be 8 years. Mental age can be equal to, less than or greater than chronological age.

3.5.3 IQ or Intelligence Quotient

The first test to measure intelligence was developed by Binet and Simon in 1905. They used the concept of mental age to express intelligence. But Terman in 1916 revised the test and devised the concept of IQ which is as given below.

IQ= MA/CA x 100

Here the IQ = Intelligence Quotient

MA = Mental Age

CA = Chronological Age

For example a child's mental age on an intelligence test comes out to be 5 years while his chronological age is 4 years then his IQ would be 5/4 x 100= 125

IQ score and its meaning.

Value of IQ	Meaning
140 and above	Genius
120 to 139	Very Superior
110 to 119	Superior
80 to 109	Normal
80 to 89	Dull
70 to 79	Borderline
60 to 69	Moron
20 to 59	Imbecile
20 and less	Idiot

3.5.4 Measurement of Intelligence

Measurement of intelligence started with Sir Francis Galton, who attempted to study gifted children. However the first standardised test of intelligence was developed by Binet and Simon in 1905. It was an individual test.

The first group test was Army Alpha Test developed in 1916 during the First World War for mass recruitment of soldiers.

Intelligence test can be classified into many categories and these are:

- Individual intelligence test – administered on one person at a time.
- Group intelligence test – administered on more than one person at a time.
- Verbal intelligence test – requires the use of language by the testee.
- Non-verbal intelligence test – involves doing some task by the testee which do not necessitate use of language.
- Culture fair tests of intelligence – involves items which are devoid of bias toward any culture.

3.5.5 Uses of Intelligence Tests

Intelligence tests are used for various purposes. However these purposes can be broadly categorised as under:

Estimation of general intelligence: Most obvious use of intelligence tests is to determine the general intelligence level of an individual. Intelligence tests are used to determine the current potential of a person and evaluate his present achievements on this basis.

Prediction of academic success: No matter what is the type of intelligence test, it can be used to predict academic success of an individual. If the intellectual estimation according to the test is high we can expect a person to excel in academics.

Appraisal of personality: Scores of an individual on intelligence tests tell not only about his intellectual capabilities but his personality as well. For example, if a person fails on items of a test. Then what reasons he ascribes for his failure tell a lot about his personality. Does he invent some excuse for that? Does he fail on easy items but is able to pass the difficult ones. Recent studies reveal that a lot many psychological problems can be diagnosed on this basis.

3.6 THEORIES OF INTELLIGENCE

G factor and S factor theory of Intelligence

Charles Spearman is generally credited with defining general intelligence. Based on the results of a series of studies collected in Hampshire, England, and other places, Spearman concluded that there was a common function (or group of functions) across intellectual activities including what he called intelligence. This common function became known as “g” or general intelligence.

To objectively determine and measure general intelligence, Spearman invented the first technique of factor analysis (the method of Tetrad Differences) as a mathematical proof of the Two-Factor Theory.

The Two-Factor Theory of Intelligence holds that every test can be divided into a "g" factor and an "s" factor. The g-factor measures the "general" factor or common function among ability tests. The s-factor measures the "specific" factor unique to a particular ability test.

Theory of Multiple Intelligence

Howard Gardner defined intelligence in terms of distinct set of processing operations that permit individuals to solve problems, create products , and discover new knowledge in a wide range of culturally valued activities. Gardner declined the idea of spearman's "g". His theory of multiple intelligences is based on studies not only of normal children and adults but also based on studies of gifted individuals (including so-called "savants"), of persons who have suffered brain damage, of experts and virtuosos, and of individuals from diverse cultures. This led Gardner to break intelligence down into at least eight different components: logical, linguistic, spatial, musical, kinesthetic, interpersonal, intrapersonal. Gardner further stated that each intelligence has unique biological basis and course of development, and different performance.

Triarchic Theory of Intelligence

Robert Sternberg proposed the Triarchic Theory of Intelligence to provide a more comprehensive description of intellectual competence. The Triarchic Theory describes three fundamental aspects of intelligence. Analytic intelligence includes mental processes through which intelligence is manifested. Creative intelligence is necessary to deal with novel situations or when an individual is automatizing performance of a task. Practical intelligence finds expression in social situation. It includes adaptation to, selection of, and shaping of the environment to fit the social situation. It considers general intelligence as part of analytic intelligence, and only by considering all three aspects of intelligence can the full range of intellectual functioning be fully understood.

Sternberg defined intelligence as an individual's assessment of success in life by the individual's own (idiographic) standards and within the individual's sociocultural context. Success depends upon combinations of analytical, creative, and practical intelligence.

3.7 HEREDITY AND ENVIRONMENT INFLUENCES

The nature versus nurture debates concern the relative importance of an individual's innate qualities ("nature", i.e. nativism, or innatism) versus personal experiences ("nurture", i.e. empiricism or behaviourism) in determining or causing individual differences in physical and behavioural traits.

Heredity is the passing of traits to offspring (from its parent or ancestors). Human offspring receives 46 or 23 pairs of chromosomes from parents out of which 23 come from mother and other 23 come from father. Physical characteristics and structures are transmitted to the child through genes contained in chromosomes. Through heredity, variations exhibited by individuals can accumulate and cause a species to evolve.

Biological factors correlating with IQ include ratio of brain weight to body weight and the volume and location of gray matter tissue in the brain. Because intelligence is at least partly dependent on brain structure and the genes shaping brain development, it is argued that genetic engineering can be exploited to enhance intelligence of animals through process of biological uplift. Experiments to this effect on mice have demonstrated superior ability in learning and memory. Besides these, the adoption studies reveal that, by the time adoptive siblings achieve adulthood they are no more similar in IQ than strangers, while twins and full siblings show an IQ correlation of 0.60. Twin studies reinforce this pattern: monozygotic (identical) twins raised separately correlate to 0.74, while fraternal twins raised together correlate only 0.60.

Environment and Intelligence

The word "nurture" include in it all the influences on development arising from prenatal, parental, extended family, and peer experiences, as well as factors such as media, marketing, and socio-economic status..

Studies reveal that family environmental factors may have an effect upon childhood IQ, accounting for up to a quarter of the variance. However, in middle age, intelligence is influenced by life style choices.

Cultural factors also play a role in intelligence. For example, in one study, instead of grouping food and tools into separate categories, a particular community participant stated "the knife goes with the orange because it cuts it"

Traits chiefly determined by environment	Traits determined by interaction of genetics and environment	Traits chiefly determined by genetics
Specific Language	Height, wieght	Blood type
Specific Religion	Skin color	Eye color

3.8 LET US SUM UP

In the preceding paragraphs we explored the meaning of cognitive development. Now we know that cognitive development includes higher mental processes like reasoning, perceptual development and acquisition of language etc. We also studied the phenomenon of attention, how it develops and it's different types. What role it plays in the development of the child. We discussed what we understand by the word language. How a child comes to acquire language. We now also know what role language has in the development of a child. Besides we have discussed the concept of executive functions and when are they called in action by the individual. We studied intelligence and various concepts related to it. We tried to acquaint our selves with relative importance of heredity and environment in our development.

3.9 UNIT END QUESTIONS

1) Discuss the concept of cognitive development and it's components.

2) What do mean by "attention"? discuss development of attention over times.

3) Discuss with example the concept of executive functions.

4) Define intelligence. What are the different theories of intelligence?

5) Discuss the relative importance of heredity and environment in our behaviour.

3.10 SUGGESTED READINGS

Anne Anastasi (1997). (7th edition). *Psychological Testing*. Prentice Hall, New Jersey.

Frank S. Freeman (2001). *Theory and Practice of Psychological Testing*. Inter Science Publishers, NY.

UNIT 4 PERCEPTUAL DEVELOPMENT

Structure

4.0 INTRODUCTION

Perceptual development provides the basis for analysing and interpreting the happenings in our external environment. Stimulation from the environment evoke sensory experiences which promote growth and development of brain. For example researches reveal that infants/toddlers with hearing loss receive limited or distorted auditory input, consequently, they may experience delays in speech and language development.

Infants and children acquire knowledge of the world around them and its operations through the sensations they receive from sensory stimuli. Development of infants or toddlers to a large extent is determined by access to sensory information in the environment. Perceptual development occurs as infants explore, manipulate and identify different features in the environment, discovering properties of and relationships between features. In fact, development of language in children is the result of these sensory experiences that contribute to cognitive growth and development.

For infants who are developing typically, the brain circuits and neural pathways that form during the first year allow in the child to anticipate of mother's entry into a room upon hearing her voice or footsteps approaching while awakening from a nap. Infants' brains release endorphins during the experience of nurturing skin to skin touch thus soothing anxiety when tired or stressed. Every time babies experience new stimuli, their brains are fine-tuned to quickly interpret and process similar experiences.

During the first three months of life, infants' brains respond to the world of sensation with greater electrical activity in areas of the brain responsible for coding stimuli of sights, sounds, and touches. As perceptual development proceeds

infants learn to associate stimuli with particular activities and anticipate events (Raymond, 2000). For example, babies learn that father's entry into the home suggests that he can anticipate touches and hugs. Such experiences provide the foundation for interpreting and making sense of the world. For infants and toddlers who are deaf/hard of hearing, the extent of hearing loss and/or amplification determines whether they rely primarily on hearing or vision, or combined input from both modalities to interpret their environment and gain understanding in the world around them.

4.1 OBJECTIVES

After completing study of this unit, you will be able to :

- Define in your own words perceptual development;
- Describe different aspects of perceptual development;
- Understand the meaning and importance of critical period;
- Identify the sensorimotor activities and their importance?
- Define sensory acuity and how it develops;
- Explain behavioural implication of sensory deprivation; and
- Elucidate the theory of perceptual development.

4.2 ASPECTS OF PERCEPTUAL DEVELOPMENTS

Touch

Touch is the very basis of interaction between parents and the child. Touching promotes early physical growth and also plays vital role in emotional development. Therefore sensitivity to touch is present at the time of birth. Newborn babies react to touch particularly on palm, around mouth and in the soles of feet.

Infants are sensitive to sensation of pain however it has been found when sugar nipples are inserted in mouth discomfort and crying are quickly reduced in the young babies. When touch produces pleasure instead of pain it increases child's responsiveness to the environment. For example, you might have noticed that when an infant is given soft soothing caresses he smiles and pays attention to caregiver. Infants explore and investigate the world around them. They run their hand on objects. When they develop the capability of reaching out to things, babies first place any object into their mouth and then have a good look at the object. This kind of exploration reaches its peak during the middle of first year and declines afterwards as babies make more use of hands to explore and investigate objects from different angles. For example infants of one year or more would turn an object around, feel its surface, rub the surface to see what happens and then again pick it up to view it with both hands.

Taste and Smell

Reactions to taste and smell are crucial for survival. Infants are innately programmed for their taste preferences. Newborns are able to distinguish several basic tastes in the manner of an adult. For example, they respond to sweetness by relaxing their facial muscles, and when the taste is sour they react by distorting their lips and so on. Taste for salty objects is not present at birth time. But by the

time infant is four months old they prefer salty water to plain water, a change that readies him for solid foods later on.

Like taste, certain smell preferences are innate. For example young babies give relaxed facial expressions when confronted with pleasant smell but express discomfort on smell of a rotten object, not only this they even express ability to recognise the source of discomforting smell by turning head in the other direction.

Hearing

Newborn babies can hear a variety of sounds but they respond more to some than other sounds. It seems they are innately programmed to respond to auditory sensations. During the first few days they are able to recognise the difference between sound patterns. For example, a series of tones, utterances of two three syllables etc. As the child grows up during the first year it organises sounds into elaborate patterns. A baby of 4 to 7 months expresses a sense of musical and speech phrasing and by 12 months, the baby can differentiate between two slightly differing tunes. A 4 month old baby can accurately turn its head in the direction of source of sound and this ability and responsiveness to sound shows marked improvement over the next six months and continues to develop further during the second year. Not only this, a 3 month old baby can fairly distinguish between pleasant and sad voices of adults.

Responsiveness to sound promotes infant's visual and tactile exploration of the environment. It also promotes attachment between infant and the caregiver. As parents talk to the baby, development of language and emotions receive further impetus.

An infant's sensitivity to sound provides fundamental basis for perceptual and cognitive development. Therefore any impairment and loss of hearing can detrimentally affect the child's development.

Hearing loss can occur prior to language acquisition, or following language acquisition. Degrees of hearing loss are measured in decibels, the greater the decibel measure, the greater the degree of hearing loss. For example, a person with a mild hearing loss, 15-40 DB (**decibel**) has difficulty hearing whispers at a close range in a quiet setting; a person with a moderate hearing loss 40-60 DB has difficulty hearing a normal voice at close range in a quiet setting; a person with a severe hearing loss cannot hear speech and can only hear loud noises such as those coming from machinery, power tools, vacuum cleaners, lawn mowers etc. A person with a profound hearing loss cannot hear speech and may only hear loud vibrating noises such as airplanes. Any type of hearing loss can present unique challenges and barriers in accessing environmental information (Northern & Downs, 1991).

Hearing loss influences children's preferences for gathering sensory information that support and shape cognitive linguistic development. Since varying degrees of auditory information are available for children with hearing loss, a need exists to maximize visual and kinesthetic intake of environmental information. Knowledge of these sensory modalities supports an understanding of an infant's or toddler's ability to interpret, integrate and respond to environmental information. Very often hearing loss results in delayed language progress, reduced task persistence, social isolation in early childhood and poor academic

performance after school entry. Actually children with auditory difficulties are less attentive to the speech of others and less persistent at task and this difficulty may be due to repeated instances in which they could not make out what people around them were saying. When children have trouble paying attention they may reduce the quality of interaction with them.

4.3 CRITICAL PERIODS

In general, a **critical period** is a limited time in which an event can occur, usually to result in some kind of transformation. A "critical period" in developmental psychology and developmental biology is a time in the early stages of an organism's life during which it displays a heightened sensitivity to certain environmental stimuli, and develops in particular ways due to experiences at this time. If the organism does not receive the appropriate stimulus during this "critical period", it may be difficult, ultimately less successful, or even impossible, to develop some functions later in life.

For example, the critical period for the development of a human child's binocular vision is thought to be between one and three years, and further critical periods have been identified for the development of hearing and the vestibular system. There are critical periods in childhood in which imprinting can occur, such as when a greylag goose becomes attached to a parent figure within the first 36 hours after hatching. These observations have led some to hypothesize a critical period for certain areas of human learning, particularly language acquisition.

Experimental research into critical periods has involved depriving animals of stimuli at different stages of development. Other studies have looked at children deprived of certain experiences due to illness (such as temporary blindness), or social isolation Many of the studies investigating a critical period for language acquisition have focused on deaf children of hearing parents.

Examples of critical/sensitive period are also found in the domain of social development. One particularly interesting example is the formation of the infant-parent attachment relationship. Attachment is the strong emotional tie between the infant and the caregiver. This reciprocal relationship develops over the first year of the child's life, and especially during the second six months of the first year. During this time, the infant's social behaviour becomes increasingly organised around the principal caregiver. The infant parent attachment relationship develops because it is important for the survival of the infant and also provides a secure base from which the infant can feel safe exploring their environment.

John Bowlby, a psychiatrist suggested that there was a sensitive period for the formation of the attachment relationship. This period is from approximately six months to twenty four months of age and coincides with the infant's increasing tendency to approach familiar caregivers and to be wary of unfamiliar adults. In addition the quality of this attachment relationship is strongly influenced by experiences and repeated interactions between the infant and the caregiver. In particular, Ainsworth's research, that was first published in the late 1960s, demonstrated that a secure attachment relationship is associated with the quality of care giving that the infant receives. More specifically, consistent and responsive care giving is associated with the formation of a secure attachment relationship

After the sensitive period, this first attachment relationship can develop, but with greater difficulty. Children reared in orphanages for the first years of life subsequently were found to exhibition unusual and maladaptive patterns of social behaviour, difficulty in forming close relationships, and indiscriminately friendly behaviour toward unfamiliar adults. These results support the notion of a critical period for the formation of the attachment relationship.

However, later studies have contributed to a modification of this notion of a critical period. Results have come from studies of infants in Eastern Europe who were abandoned or orphaned and, therefore, raised in institutions prior to adoption by families in North America and the United Kingdom. These results have indicated that these adoptees were able to form attachment relationships after the first year of life and also made notable developmental progress following adoption. As a group, however, these children appeared to be at an increased risk for insecure or maladaptive attachment relationships with their adopted parents. This evidence, then, is consistent with the notion of a sensitive period, rather than a critical period, for the development of the first attachment relationship.

4.3.1 Language Acquisition

The Critical Period Hypothesis states that the first few years of life constitute the time during which language develops readily and after which (sometime between age 5 and 12), language acquisition is much more difficult and ultimately less successful. Evidence supporting this hypothesis comes from hildren who failed to develop language after being deprived of early linguistic input. The most famous cases are Genie and Victor of Aveyron. However, it is also possible that these children were retarded from infancy and abandoned because of this, or that inability to develop language came from the bizarre and inhuman treatment they suffered. Other evidence comes from *neuropsychology* where it is known that adults, well beyond the critical period, are more likely to suffer permanent language impairment from brain damage than are children, believed to be due to youthful capabilities of neural reorganisation The nature of this phenomenon, however, has been one of the most fiercely debated issues in psycholinguistics and cognitive science in general for decades.

4.3.2 Second Language Acquisition

The theory has often been extended to a critical period for second language acquisition, although this is much less widely accepted. Certainly, older learners of a second language rarely achieve the native like fluency that younger learners display, despite often progressing faster than children in the initial stages.

David Singleton (1995) states that five percent of adult bilinguals master a second language even though they begin learning it when they are well into adulthood, that is long after any critical period has presumably come to a close.

Second Language Acquisition involves a critical period, nevertheless, it is generally agreed that younger people learning a second language typically achieve fluency much faster than older learners. Older learners may be able to speak the language but will lack the native fluidity of younger learners. The Second Language Acquisition Critical Period coincides approximately with the Formal Operational Stages of Jean Piaget's theory of cognitive Development (age 11+).

4.4 SENSORIMOTOR ACTIVITIES

Hand eye coordination is one example of sensory integration. The process demands integration of what we visually perceive about an object, and what we tactilely perceive about that same object. Inability to combine the two senses within the brain would leave the child with less ability to manipulate an object. Hand-eye coordination is the tactile sensation in the context of the visual system. The visual system is very static, but the hands and other parts used in tactile sensory collection can freely move around. Thus movement of the hands needs to be included while mapping of both the tactile and visual sensations is done. In the absence of such integration the child would be at a loss to know where his hands were moving, and what was he touching and looking at. For example , look at an infant. The infant picks up objects and puts them in his mouth, or touches them by his feet or face. All these activities of the lead to the formation of spatial maps in the brain and the realisation that "Hey, that thing(hands) that's moving this object is actually a part of me."

Seeing the same thing that they are feeling is a major step in the mapping that is needed for infants start realising that they can move their arms and interact with an object. This is the earliest and most explicit way of experiencing sensory integration.

Sensorimotor contingencies take two forms: ***movement-dependent*** **and** ***object-dependent.*** Movements of body can modulate sensory stimulation, and when this occurs, the resulting contingencies are movement-dependent ones. However, movements of the object can also produce sensory changes, and in such cases, the resulting contingencies are object-dependent ones.

Jean Piaget was the first psychologist to advocate that children are not passive receivers but they actively explore, investigate and manipulate the environment to make sense of it. He gave detailed account of sensorimotor activities of infants in sensorimotor stage.

The **sensorimotor stage** is the first of the four stages of cognitive development. "In this stage, infants construct an understanding of the world by coordinating sensory experiences (such as seeing and hearing) with physical, motoric actions. Infants gain knowledge of the world from the physical actions they perform on it. An infant progresses from reflexive, instinctual action at birth to the beginning of symbolic thought toward the end of the stage. *Piaget* divided the sensorimotor stage into six sub-stages":

Sub-Stage	Age	Description
1) *Simple Reflexes*	Birth-6 weeks	"Coordination of sensation and action through reflexive behaviours". Three primary reflexes are described by Piaget: *sucking* of objects in the mouth, following moving or interesting objects with the eyes, and closing of the hand when an object makes contact with the palm (*palmar grasp*). Over the first six weeks of life, these reflexes begin to become voluntary actions; for example, the palmar reflex becomes intentional grasping).

2) *First habits and primary circular reactions phase*	6 weeks-4 months	"Coordination of sensation and two types of schemes: habits (reflex) and primary circular reactions (reproduction of an event that initially occurred by chance). Main focus is still on the infant's body". As an example of this type of reaction, an infant might repeat the motion of passing their hand before their face. Also at this phase, passive reactions, caused by *classical* or *operant conditioning*, can begin.
3) *Secondary circular reactions phase*	4-8 months	Development of *habits*. "Infants become more object-oriented, moving beyond self-preoccupation; repeat actions that bring interesting or pleasurable results". This stage is associated primarily with the development of *coordination* between *vision* and *prehension*. Three new abilities occur at this stage: intentional grasping for a desired object, secondary circular reactions, and differentiations between ends and means. At this stage, infants will intentionally grasp the air in the direction of a desired object, often to the amusement of friends and family. Secondary circular reactions, or the repetition of an action involving an external object begin; for example, moving a switch to turn on a light repeatedly. The differentiation between means and ends also occurs. This is perhaps one of the most important stages of a child's growth as it signifies the dawn of *logic*.
4)*Coordination of secondary circular reactions stage*	8-12 months	"Coordination of vision and touch—hand-eye coordination; coordination of schemes and intentionality". This stage is associated primarily with the development of logic and the coordination between means and ends. This is an extremely important stage of development, holding what Piaget calls the "first proper *intelligence*." Also, this stage marks the beginning of *goal orientation*, the deliberate planning of steps to meet an objective.
5) *Tertiary circular reactions, novelty, and curiosity*	12-18 months	"Infants become intrigued by the many properties of objects and by the many things they can make happen to objects; they experiment with new behaviour". This stage is associated primarily with the discovery of new means to meet goals. Piaget describes the child at this juncture as the "young scientist," conducting pseudo-experiments to discover new methods of meeting challenges.
6) *Interna-lisation of Schemes*	18-24 months	"Infants develop the ability to use primitive symbols and form enduring mental representations". This stage is associated primarily with the beginnings of *insight*, or true *creativity*. This marks the passage into the preoperational stage.

"By the end of the sensorimotor period, objects are both separate from the self and permanent". "*Object permanence* is the understanding that objects continue to exist even when they cannot be seen, heard, or touched". "Acquiring the sense of object permanence is one of the infant's most important accomplishments, according to *Piaget*".

4.5 SENSORY ACUITY

Sensory Acuity is a phrase used in Neuro Linguistic Programming. It deals with being more aware of everything that is going on around you. **.** Sensory acuity is the actual physical ability of the sensory organs to receive input,. We address acuity needs with devices such as glasses and hearing aids. We address processing needs with changes in activities, instructions, environments and practice. The term 'acuity' refers to the actual physical ability of the sensory organs to receive input.

A person's visual acuity refers to the person's ability to see; we characterise one's visual acuity as 20/ 20 vision, or some other numbers to reflect the accuracy of the eyes to see both close and distant objects. Auditory acuity is the person's ability to hear, and we also characterise one's hearing with numbers that reflect the decibels that can be heard accurately. Acuity can be corrected with glasses (for vision) and hearing aids (for hearing). It is important to understand the distinction between 'acuity' and 'perception'. Perception refers to the person's ability to understand, or make meaning out of the sensory input received through the sensory organs (such as the eyes and ears). The perceptual process occurs through mechanisms in the brain that link the current sensory information with memories and past experiences with similar sensory information. Acuity is only the part of the process that receives the input accurately, and although it enables perception to occur, acuity only contributes the physical information and not the interpretation part of the process.

4.5.1 Visual Acuity

Of all the senses visual senses are the most important and human beings depend on it the most for exploration and investigation of the environment. At the time of berth visual system is less developed and it continues to develop in the eye and the brain even after berth. Since visual structures are still developing, newborn babies can not focus their eyes very well consequently their visual acuity is limited. At the time of berth an infant can see only upto 20 feets as compared to 400 feets of adult capacity. Infants are also not able to see near objects clearly. Though infant's visual acuity is limited yet they actively explore the environment around and track moving objects. But their eye movements are slow and inaccurate. However, by the time the baby is 3 month old he shows marked improvement in visual structures and they are able to focus objects in the manner of adults and by 6 months it reaches adult level i.e. 20/20. With eye movement coming under voluntary control scanning and tracking are also markedly improved.

Like visual acuity color perception also registers improvement. Newborn babies are not good at distinguishing between colors. However brain structures responsible for processing of color sensation develop rapidly and by the time the infant is 2 month old he can discriminate colors across the entire spectrum. A 5 month old baby is able to regard a color as the same, even under different lights.

With the ability to see more clearly and explore the world more perfectly babies figure out characteristics of the objects and how they are arranged in the space. This is evident in the development of perception of space and depth.

4.6 SENSORY DEPRIVATION

Sensory deprivation or **perceptual isolation** is the deliberate reduction or removal of *stimuli* from one or more of the senses. Simple devices such as *blindfolds* or *hoods* and *earmuffs* can cut off sight and hearing respectively, while more complex devices can also cut off the sense of smell, touch, taste, thermoception (heat-sense), and 'gravity'. Sensory deprivation has been used in various *alternative medicines* and in *psychological* experiments (e.g., see *Isolation tank*).

Short-term sessions of sensory deprivation are described as relaxing and conducive to *meditation*, however, extended or forced sensory deprivation can result in extreme *anxiety*, *hallucinations*, bizarre thoughts and depression.

Lines above describe the behavioural situation of an adult subjected to sensory deprivation. However, sensory deprivation in early developmental stages can have detrimental effect on the development cognitive structures and tasks. Babies reared in severely deprived families or institutions remain substantially below average in physical and psychological development and display behaviour and emotional problems through out childhood. It has been observed that infants spending first 2 years or more in deprived or poor environment experience delays in all domains of development. For example, parents of adopted orphanage children often report visual problems. Children reared in poor environment often suffer from ***strabismus*** (commonly known as crossed eyes)- a condition in which the eyes, due to muscles do not converge on the same point . Such children show abnormalities in the brain's visual structures and permanent deficits in visual acuity, depth perception, tracking of moving objects. These children even show deficits in intermodal perception. Consequently such children face problem in integration of information from different modalities. Overwhelmed by the information they often react to it in disorganised behaviour or withdrawal. Overall of effect of impoverished environment is seen in delayed motor, cognitive and social development.

Self Assessment Questions

Put tick over the alternative that you think is right

1) Touching promotes physical and emotional development	T/F
2) Newborns can not distinguish between different tastes	T/F
3) Certain smell preferences in newborns are innate	T/F
4) Hearing loss can be both prelingual and postlingual	T/F
5) Critical periods do not apply to language development	T/F
6) Piaget mentioned 8 sub stages of sensorimotor stage	T/F
7) Sensorimotor contingencies take five forms	T/F
8) Sensorimotor stage is first stage of cognitive development	T/F
9) Visual acuity is limited at the time of birth	T/F
10) Sensory deprivation delays development	T/F

4.7 THEORIES OF PERCEPTUAL DEVELOPMENT

In the paragraphs above we tried to understand the development of perceptual capacities of infants. Now the question is how to explain all these developments and inter relate them. Answer to this was provided by Eleanor and James Gibson, Gibsons put forward the theory of ***Differentiation***.

This theory stated that infants actively search for invariant features of the environment i.e. they look for those features which are stable in a changing world. For example, take the case of pattern perception, initially what babies perceive is a mass of stimulation but they are looking for feature that stand out to make contour or border of a stimulus and begin to form some image representing an object say face. Next they explore internal features and stable relationships among these features. This principle applies to the development of intermodal perception as well. Thus we can assume that infants have a built in capacity or tendency to look for order and stability in the environment that surrounds them and with increase in age it gets fine-tuned.

Another concept given by Gibsons to explain perceptual development was ***Affordances***. It means action possibilities that a situation offers an organism with certain motor capabilities. For example, we know that we can squeeze, roll and bounce a ball that means we are of possible actions that we can perform with the ball. Awareness of affordances makes a child future oriented and determines success. Affordances is acquired in the process of exploration and investigation.

4.8 LET US SUM UP

In the above paragraphs we studied perceptual development of the child and I think you can now discuss with your friends, what is perceptual development and what are the various aspects of development? We studied touch, taste and smell, and hearing and now we understand how a child acquires these capabilities. There has been discussion on critical periods of development and sensitive period of development. We discussed critical period in language acquisition by the child. A discussion on development of sensorimotor activities also took place in the preceding paragraphs. You are now able to describe how a child comes to acquire sensorimotor skills and how acquisition of different skills is related to each other. Besides we discussed the topic of sensory deprivation and its impact on the development of the child by giving examples of children reared in foster homes and orphanages. In the end we studied theories of perceptual development trying to explain, how acquisition of so many interrelated capacities by the child make sense.

4.9 UNIT END QUESTIONS

1) Write an essay on perceptual development and its aspects.
2) Do you think critical periods really exist? comment
3) Discuss Piaget's stages of cognitive development.
4) What do you understand by sensory deprivation? does it affect developmental process?

4.10 ANSWERS OF SELF ASSESSMENT QUESTIONS

Self Assessment Questions 1

Check Your Progress by ticking right over T/F

1) Classical conditioning was developed by Pavlov True
2) Operant conditioning was developed by Skinner True
3) Skinner mentioned four types of reinforcement schedules True
4) Reinforcement can be both negative and positive True

Match the following psychologists with different perspectives of development

Sigmund	a) Psychodynamic perspective
Jean Piaget	b) Cognitive perspective
Skinner B.F.	c) Learning perspective
Albert Bandura	d) Social-cognitive perspective
Vygotsky	e) Socio-cultural perspective
John Bowlby	f) Evolutionary perspective

Self Assessment Questions 2

State whether the following statements are true or false by putting a 'X' over the appropriate letter (T or F).

i) Last portion of brain to develop was telencephalon. (True)
ii) Earliest part of brain on the scale of development is mylencephalon. (True)
iii) Diencephalon developed before telencephalon. (True)
iv) Mesencephalon comes before diencephalon but after metencephalon. (True)

Self Assessment Questions 3

Tick mark the alternatives given against the statements given below:

1) Attention is motor process. True
2) Attention involves focusing one aspect while ignoring others. True
3) Attention develops over a period of time. True
4) Language is not a system of signs. False
5) Language is an innate property of child. False
6) Language plays no role in socialisation. False
7) Language is acquired in phases. True

Self Assessment Questions 4

Put tick over the alternative that you think is right

1) Touching promotes physical and emotional development True
2) Newborns can not distinguish between different tastes False

3) Certain smell preferences in newborns are innate — True
4) Hearing loss can be both prelingual and postlingual — True
5) Critical periods do not apply to language development — False
6) Piaget mentioned 8 sub stages of sensorimotor stage — False
7) Sensorimotor contingencies take five forms — False
8) Sensorimotor stage is first stage of cognitive development — True
9) Visual acuity is limited at the time of birth — True
10) Sensory deprivation delays development — True

4.11 SUGGESTED READINGS

Laura E. Berk (2003) *Child Development. Pearson*, Prentice Hall, New Delhi.

Elizabeth B. Hurlock (2004) *Child Development*. Tata Mcgraw- Hill, New Delhi.

Singh Arun K.(2004) *Cognitive Psychology*. Motilal Banarsidas, New Delhi.

Morgan C.T. (1989) *Introduction to Physiological Psychology.* Tata Mcgraw-Hill, New Delhi.

Francis Lieukel (1999)) *Introduction to Physiological Psychology*. Tata Mcgraw-Hill, New Delhi.

UNIT 1 DEFINITION AND CONCEPT OF SENSATION AND PERCEPTION

Structure

1.0 INTRODUCTION

You walk in a flower garden and see a beautiful rose, the word comes out from your mouth 'how beautiful', or you walk by the side of a river and see a crocodile, recognise it and escape. In our daily life we distinguish between two objects, although the world has dazzling array of objects like humans, animals, houses, plants, etc. But how do we really do it? How do we know the world around us? Have you ever though on this issue? If not, does not matter! This chapter on sensation and perception will help you to understand the process of getting complex and diverse set of things "out there" inside our brain clearly and vividly. Philosophers have attempted to answer such problems throughout the history of civilisation but in the past century such issues have become central point of psychologists. The processes through which we come to experience the stimuli present in the environment are known as *sensation* and *perception.* Human senses *translate* physical energy into *electrical signals* by specialised receptor cells and *transmit* to our *brain* via specialised sensory nerves through which information about our environment is received. Our senses include *vision*, *hearing, smell, taste* and *skin senses*. The study of sensation is related to the initial contact between organism and the physical environment focusing on different forms of sensory

stimulation (example: electro-magnetic pressure, sound-waves) and the input registration by the sense organs (e.g. the eyes, ears, nose, tongue and skin). Perception is the process through which we interpret and organise the received information so as to produce our conscious experience of objects and their relationship. In this process physical energy; such as light, sound waves, heat; emanating from objects is transformed by the concerned sense organs into a code and transferred to and interpreted by the brain. The line between the two terms sensation and perception, therefore, is somewhat arbitrary. Sensation typically refers to the direct reception and transmission of messages, whereas perception refers to the active process of integrating and organising these sensations. In the following sections you will come to know some more details of sensory process like vision, hearing, skin senses, smell and taste and characteristics of related physical energy like light, sound waves, heat, changes in air pressure, pain etc. you will also know about perception as an active process with perceptual selectivity and perceptual constancy. Perceptual selectivity will include attention, perceptual set, perceptual accentuation and perceptual constancy will have some details of size, shape, colour and brightness constancies. You will also know as to how perception is organised according to Gestalt theory. This way, you will be in a position to understand scientifically the process of sensation and perception through which we are able to recognise objects in this world and make distinction among them. The whole process will include reception of physical energy by receptor cell, conversion into electrical impulses traveling along nerve fibers to the central nervous system and finally to the appropriate area of cerebral cortex. Information received in the appropriate area of brain is processed and interpreted to yield our experienced perception. In short, we feel something in sensation when stimulus is present and when meaning is added to them it becomes perception. So perception is sensation and meaning of the situation.

1.1 OBJECTIVES

After reading this unit, you will be able to:

- Explain the meaning of sensation;
- Describe the process through which one makes distinction between different objects of the world;
- Explain how our senses like vision, hearing, smell, taste and skin work;
- Define perception; and
- Identify the process of perception like perceptual selectivity, perceptual constancy and perceptual organisation.

1.2 MEANING OF SENSATION

We live in a world where complex and diverse set of things are around us – houses, plants, animals, paper, pencil, computer and billions of other people. How do we recognise them and make distinctions? How do we feel them and make out meanings out of them? The objects present in the world are known as *stimulus*. Physical energy (such as light, heat, sound waves) emanating from objects are transformed by sense organs into a code and interpreted by brain.

The initial contact between organisms and their physical environment constructing knowledge out of raw materials is known as sensation.

The relationship between various forms of sensory stimulation (electro-magnetic, pressure, sound waves) and their registration by sense organs (eyes, tongue, skin, ears) is the process of sensation. This definition of sensation has the following components:

i) involvement of sense organs of the organism.

ii) presence of stimulus in the physical environment

iii) constructing knowledge out of raw material and

iv) initial contact i.e. contact without meaning

Take an example: you encounter the pleasant fragrance of a rose. You get the fragrance through the sense organ 'nose'. Rose is the stimulus present in the physical environment. You feel something and it is constructing knowledge out of raw stimulus material. You just have thye initial contact without clear cut knowledge of source i.e. rose. Feeling up to this stage is sensation. Imagine some other example of similar nature and try to understand the meaning of sensation. Sensation is the starting point of knowledge of presence of any object around us.

1.2.1 Human Senses and Physical Energy

The beautiful sight of sun-rise, the intense "crack" of start of an old motor-cycle, the smooth touch of a skin of body, the summer heat, the intense cold, the foul odor; the sweet taste, all these are experienced by us. But how ? These are all through different sense organs. Our sense-organs-eyes, ears, skin, nose and tongue – provide sensations of vision, hearing, skin senses, smell and taste. Physical energy emanates from objects such as light, sound waves, heat and touch. These physical energies provide different types of sensations when presented as stimuli. You have known here two things, that is (i) Our senses include vision, hearing, skin senses, smell and taste. (ii) Physical energies emanates from objects such as light, sound waves, heat and touch. In the absence of physical energies as stimuli, sensation normally does not take place.

1.2.2 Process of Sensation

The process of sensation is very easy to understand. Physical energy, such as light, sound waves, heat; emanating from objects becomes stimuli and is received by concerned sense organs like eyes, ears, and elsewhere through specialised receptor cells. The energy is next converted into electrical impulses and this process is known as transduction.

The translation of a physical energy into electrical impulses by specialised receptor cells is known as transduction.

The electrical impulses then travel from the sense organs along nerve fibers to the central nervous system and finally to appropriate area of the cerebral cortex. The process of sensation includes the direct reception and transmission of messages to cerebral cortex. The process may be understood in the following diagram more easily.

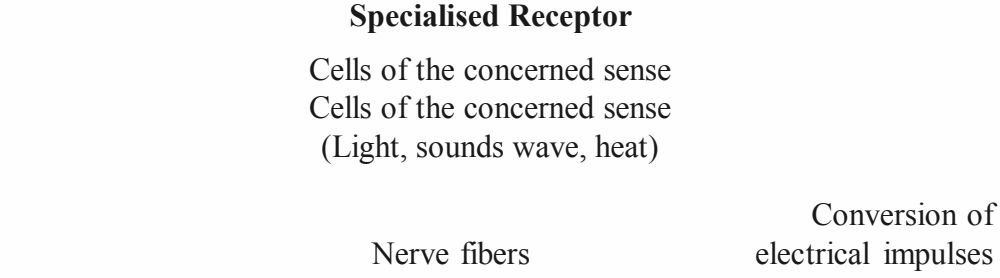


Fig.: Direct reception and transmission of messages to cerebral cortex (process of sensation)

Self Assessment Questions

1) What is sensation? Describe with suitable examples.

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2) Relate human sensation and physical energy. How are these related?

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3) Describe the process of sensation with a diagram.

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1.3 OUR SENSES

1.3.1 Vision

The greatest gift of our life is vision through which we know most of the things about the outside world. It dominates in our adjustment. This is why of all the senses scientists have done much researches in the area of vision. We see through our eyes. This is like a colour television camera. The physical stimulus i.e. light admits into it through a small hole and passes through lens that focuses an image

on a photosensitive surface. The vision is managed through the cornea, pupil, iris and retina in the eyes and receptor cells transmit finally the information to the brain via optic nerve. Sensation of *colour* takes place by nerve cells called *cones. Black and white* sensation takes place by optic nerves called *rods*. Rods and cones are distributed on retina, the number being more than 100 millions and 6 millions respectively. The structure of eye with function will be discussed in the next section in details. These rods and cones help in light or dark adaptation. You may have the experience of going to theater when movie has started. The theater is dark and you stumble around not making out location of seat or people. After a few minutes you are able to locate seat and people around.

Adaptation from bright to dim light is managed by Rods and cones present in eyes.(Look at the eye diagram given below) Chemicals in rods and cones are build-up faster in dim light with greater concentration than in by bright light stimulation, hence, adaptation to darkness becomes easy. The cones adapt quickly in the dark as compared to rods. But when adapted fully, the rods are much more sensitive to light than cones. Cones are located in the centre of the eye and rods on the edge of the retina. In pitch darkness if you want to see a dim light look away from the object and not on it, you will see dim light more clearly. When you see away from the object in darkness rods situated on the edge of retina become more active, providing better visibility. Try this process in cinema hall. When movie is in progress and you want to move to the gate with dim light on the passage, you will have better visibility of the way if do not look at dim light point but away of it. It is said that a candle flame can be seen at a distance of 30 miles on the dark clear night as rods of retina becomes more active due to distinct image.

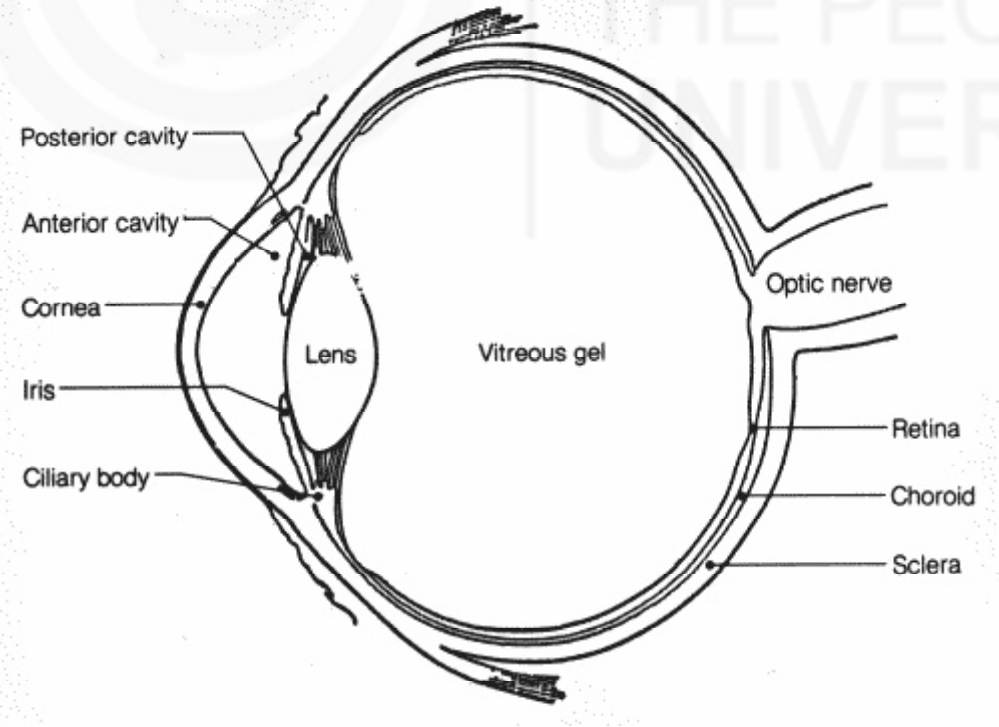

Fig.1.1: Diagram of the eye

1.3.1.1 Visual Acuity

You see many people using spectacle for reading or for seeing far objects or both. They are not able to discriminate the details in the field of vision. This is greatly affected by the shape of a person's eyeball. When eyeball of a person is too big, the lens of eye focuses the image in front of the retina and not directly on it. In this case, vision to near object is clear but far objects appear blurred. This phenomenon is called *nearsightedness.* When eye ball is too short, the lens focuses the image behind the retina and the result is that far objects are in sharp focus but close objects become indistinct. This condition is known as *farsightedness.* Nearsightedness or farsightedness are the examples of non-discriminating objects in the field of vision properly. This ability to discriminate properly the details in the field of vision is known as *visual acuity*. There appears to be a relationship between advancement in age and visual acuity. Normally, as age advances visual activity becomes poorer in most cases.

1.3.1.2 Blind Spot

At one spot of the retina where the nerves of the eye converge to form the optic nerve is called *blind spot*. Blind spot has no visual acuity. These optic nerves connect the eyes to the brain from the back wall of the eyeball. People compensate the effects of blind spot by moving their head or making use of other eye unknowingly. How sensation of vision takes place with visual acuity in our daily life, you must have understood. The main points are:

- The physical energy for vision is light.
- Eyes manage vision.
- Rods and cones help in dark adaptation.
- The ability to discriminate the details in the field of vision is visual acuity.
- Blind spot, a point in retina, does not have visual acuity.

1.3.2 Hearing

Ear through which sensation of hearing takes place is a fascinating instrument. You have two ears on two sides which detect sound from the external world. Sound source produces changes in air pressure by vibrations or movements. It is noticed and registered through the ears. There are three main characteristics of sound – *pitch, loudness* and *Timbre*. Pitch, the high or low quality of a sound, is determined by the frequency of vibration of waves. Faster the vibration, higher the pitch. Loudness is the amplitude of sound waves, the expansion and contraction. When you turn up the volume of television, you increase the amplitude of vibrations, hence, sound becomes louder. Timbre is the quality of sound that comes from a particular sound source. A note played on Shehnai will not sound the same as played on piano. This difference of richness is known as *timbre*. This way, pitch, loudness are the characteristics of hearing and frequency, amplitude are the characteristics of sound waves. You may now be interested to know as to how the ear receives and amplifies the vibration movement of the air and sends information to the nervous system. To understand this process it would be desirable to see the structure and function of the ear. The structure of the ear has three parts – the *outer,* the *middle* and the *inner* ones. You may have a look at the structure of the ear given in the diagram below:

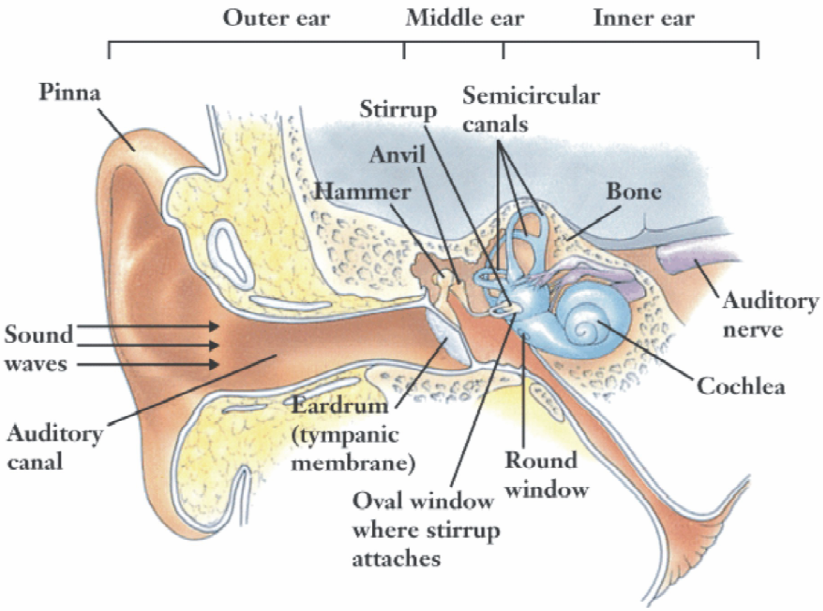

Fig. 1.2

1.3.2.1 Structure of Ear

The outer ear is made of a canal and the eardrum (tympanic membrane). The middle ear has three bones: the malleus, the incus and the stapes, the Latin names. The English equivalant of these terms are hammer, anvil and stirrup. The inner ear contains a snail-shaped structure called cochlea with fluid inside. The function of the three parts of the ear is different but related to one another. Changes in air pressure are received in the outer ear eardrum and the membrane moves in response to the pressure changes. The middle ear sends sound waves to the inner ear with movements in the three bones. These vibrations are transmitted to the fluid inside cochlea. At this point the sound waves reach the receptor cells for hearing and are translated into nerve impulses. The auditory nerve sends the nerve impulses into appropriate portion of the brain. This way, you are able to hear a sound around you. You may be aware that these days noise pollution has become one of the greatest environmental hazards. Why is it so ? The answer is — when the cells of the inner ear are very frequently bombarded with loud sounds these can be damaged leading to hearing loss. Many million people of the world suffer from hearing loss due to noise pollution. You, therefore, in your life try to avoid noise both by reception or by creation. Always speak in low voice which shows politeness and discourage others to speak in loud voice. This will keep your hearing intact and others too throughout your life.

Self Assessment Questions

1) What is Visual acuity? What are the factors related to acuity and how is it measured?

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2) Define and describe the blind spot. Give an example

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3) Describe the hearing process and indicate the process of sensation of hearing. How does it affect behaviour.

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1.3.3 Smell

Of the five senses vision, hearing, smell, taste and skin the taste and skin senses tell us about the objects and events close to our body and the remaining three that is, vision, hearing and smell receptive systems enlarge our world by responding to a stimuli at a distance. Of these, smell in many ways is most primitive. The sense of smell, you get, from stimulation of receptor cells present in the nose. Smell provides information about chemicals suspended in air which excite receptors located at the top of our nasal cavity. (Diagram of the nose is given below)

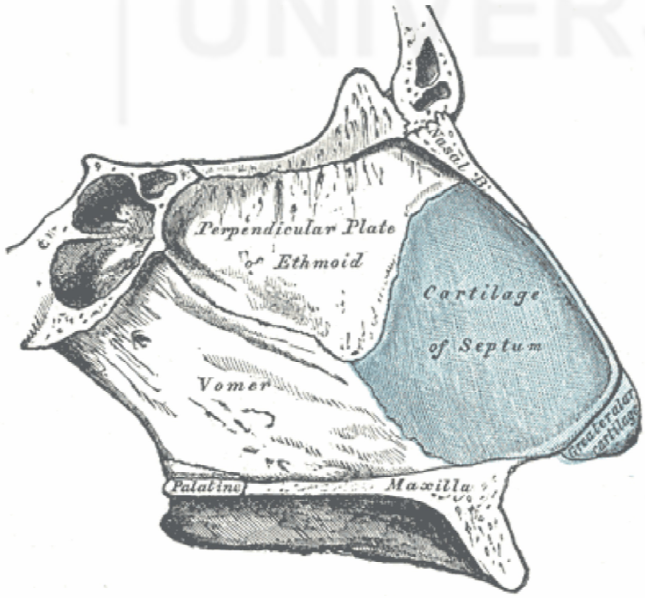

Fig. 1.3: Diagram of the nose

The gaseous chemical molecules suspended in air are normally heavier than air, therefore, these collect on the floor or ground. To smell you have to sniff coming closer to the object. Breathing through nose increases the number of molecules

that hit olfactory membrane and smell is detected. Human beings have only about 50 million of olfactory receptors where as dogs possess more than 200 million such receptors. Dogs are more sensitive to smell, therefore, they are put in Dog-squad to detect crime and criminals in police department. Further, sensitivity of our olfactory receptors are limited in terms of stimuli range. Carlon (1998) stated that human olfactory receptors can detect only substances with molecular weights – the sum of the atomic weights of all atoms in an odorous molecule – between 15 and 300. This is the reason that you can smell the alcohol contained in a mixed drink, with a molecular weight of 46, but cannot smell one table spoon sugar, with a molecular weight of 342. The sensation of smell in humans, in many ways, is the most primitive as compared to other senses. But in other species olfaction is more effective. Certain animals secrete special chemical substances called *pheromones* which trigger particular reactions in other members of their own kind. In some cases, olfaction works as primitive form of communications. Individual differences are available in humans in smell sensation due to different reactions of olfactory receptors in them and the placement of stimuli.

1.3.4 Taste

Sensation of taste is related to smell as well. Tastes primarily depend upon the taste buds scattered across the upper surface and side of tongue. Each taste bud contains several receptor cells. Human beings posses about 10,000 taste buds. In contrast, chickens have only 24 and the maximum number of taste buds is in catfish, the number being 175,000, distributed all over the body. You may be thinking, based on your experience, that you can distinguish a large number of flavours in food. It is not true. You have only four basic tastes – *sweet, salty*, *sour* and *bitter*. But why do you have such an opinion that you can distinguish many more tastes than these four? The reason is that while eating you are not aware of only taste of the food but of its smell, its texture, its temperature, the pressure it exerts on your tongue and mouth, and many more sensations. But the basic sensation of taste depends on taste buds. Normally, sensitivity to salt is highest on the tip and sides of the tongue. Sour is detected on the sides of the tongue and bitter on the back of the tongue. This view is based on widely held hypothesis that each of these primary taste qualities is associated with different kinds of taste receptors. Further, question about the stimuli that produce these four basic taste qualities, the answer is not definite. Sweet is produced by various sugars, but also by saccharin, a chemical compound that is structurally very different from sugar. Just what these substances have in common which activate the same taste receptors is still not known. The number of taste buds on the tongue decreases with age. As a result, older people are comparatively less sensitive to taste than children are. (Diagram of tongue given below)

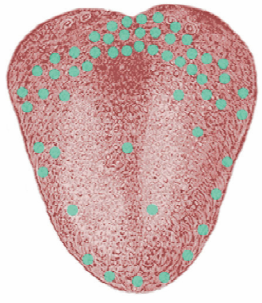

Fig. 1.4: Tongue Diagram

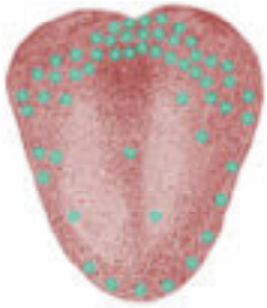

Fig. 1.5: Bitter Taste Buds

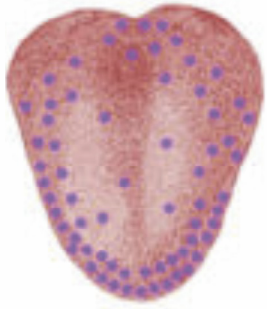

Fig. 1.6: Salty Taste Buds

Fig. 1.7: Sour Taste Buds

Self Assessment Questions

1) What is the process of smelling and how does the brain transmit this information to us so that we could smell something and do something to either receive the smell or ward off the smell?

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2) Describe the process of sensation of taste. What is the importance of taste buds. Discuss their role in taste with a daigram.

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1.3.5 Skin Senses

You try one experience. Keep three buckets of water – one cold, another warm and third lukewarm. Now put one hand in cold water bucket and another hand in warm water bucket. You will feel that warmth or cold comes only on the portion where the hands meet both water and air. Take out your both hands and put in the third bucket filled with lukewarm water. You will feel cold to the hand that was in warm water and warm to the hand that was in cold water. The sensation in hand depends on the temperature to which the skin was previously adapted. Stimulation of the skin informs the organism of what is directly adjacent to its own body. Skin senses are, in fact, a combination of at least four different sensations: pressure, warmth, cold and pain. These sensory qualities are so very different that led to the belief that they are produced by various underlying receptor systems. Skin sensitivity is acute in those parts of the body that are most relevant to exploring the world that surrounds us directly: the hands, the fingers, the lips, the tongue. Different spots on the skin are not uniformly sensitive to the stimuli which produce different sensations. Now have another experience of skin sensation on yourself. Get yourself blind folded. Now with the tip of a ball pen

probe an area of your skin lightly, you will feel pressure at certain points where the pen contacts your skin, but not at every point. You do the same process one by one with a cold wire, warm wire and a pin. With cold wire you will feel cold at various specific points, with warm wire, you will feel warmth at various points and the point of pin will produce spots of pain. Such a sensation takes place as different points on the skin are serviced by receptors that are sensitive to different kinds of stimuli. The experience you have when you are touched lightly with a pointed object is called *pressure or touch*. Some parts of the body are more sensitive to pressure or touch. The lips, the fingers, the hands and the tip of the tongue are most sensitive areas. The arms, legs, and body trunk are less sensitive.

This way, different account of touch or pressure is required to produce such an experience which varies for different parts of the body. Less is known about the underlying receptor systems for temperature and pain. Skin also contains receptors for heat and cold. These temperature receptors are more concentrated on the trunk of the body with hands and feet with standing greater temperature extremes. Cold receptors are about six times more than the heat receptors. Sensation of pain has been the subject of much controversy. Some investigators believe that these are specialised pain receptors which are activated by tissue injury and produce an unpleasant sensation. Others believe that pain is the outcome of the over estimation of any skin receptor. Pain seems to be received by a variety of nerve endings not only in skin but in other sense organs. Extreme stimulation of any sense organ may cause pain like very bright lights, loud noises, high or low temperature. More details about sensation and perception of pain you will come to know, in one of the units to follow.

1.3.6 Kinesthetic Sense

The kinesthetic senses provide information about positions and movements of your muscles and joints. Close your eyes and touch your lips with finger. You know where both parts of the body are. The sense that gives us information about the location of our body parts with respect to one another and allows us to perform movement is known as Kinesthesia. Kinesthetic receptors are available in muscles which send information to the brain about the load on the muscle and degree of contraction. Other receptors are in joints. There kinesthetic receptors provide information about body movement. Kinesthetic senses moreover provide sense of balance or equilibrium of the body. When this sensitivity is destroyed one may not be in a position to maintain balance in the body parts with sense you make destination between objects of different weights by lifting. These senses keep tract of body movement and body position in relation to gravity.

1.4 PERCEPTION

You have come to know now that sensation is the first stage of the experience of a stimulus or stimuli present in the environment through our senses. But our sense organs become more active when encounters a sensation and act in more complex manner. The eye becomes more than a camera; the ear is more than a microphone. Both sensory systems transform their stimulus inputs at the very start of their neurological journey, emphasising differences and minimising stimulation that remain unchanged. When you see a red rose you merely do not have a sensation of the presence of an object around you but you recognise it and know the characteristics of the rose. The sensation gets a meaning. This meaning

depends not only on the presence of the stimulus but on many other factors like past experience, our needs, and our values. One who has not known about the rose may not be able to make meaning out of it. We rarely got one sensation at a time. We are most of the time flooded with a magnitude of messages. We sort it out, identify and interpret in order to construct a meaningful picture of reality. We may define perception as:

An active process in which we select, organise and interpret sensory input to achieve a grasp of our surroundings

1.4.1 Process of Perception

When perception is an active process, where individual plays an important role in determining objects and reactions around environment, you may be interested in knowing the main processes involved in it. How a person is able to get one message, out of thousands of messages of different senses active at a point of time, sent to the brain? The process of getting a small portion of sensations in one's environment selected by the individual to be transmitted to the brain for meaning is known as *perceptual selectivity*. The first process to this effect is *attention* in which certain stimuli are selected to be transmitted to the brain and others are suppressed. Individual has the tendency to attend to certain sensations we expect to, while remaining unaware of things we do not expect. This phenomenon is called *perceptual set*. As early in 1935, Siipola demonstrated the phenomenon of perceptual set in responses to words. He had two groups of subjects. One group was told that they would be shown words that referred to animals. The other group was told that they would be shown words relating boats. The two groups had different responses as per their expectations. The letters forming words really did not mean anything but the first group perceived words relating to different animals and the second group pertaining to different aspects of boat. Such a type of response was there as they had perceptual set. So the perceptual set is the tendency to perceive what one expect to. You may experience the phenomenon of perceptual set with the help of an example cited by Leeper (1935).

Fig. A:

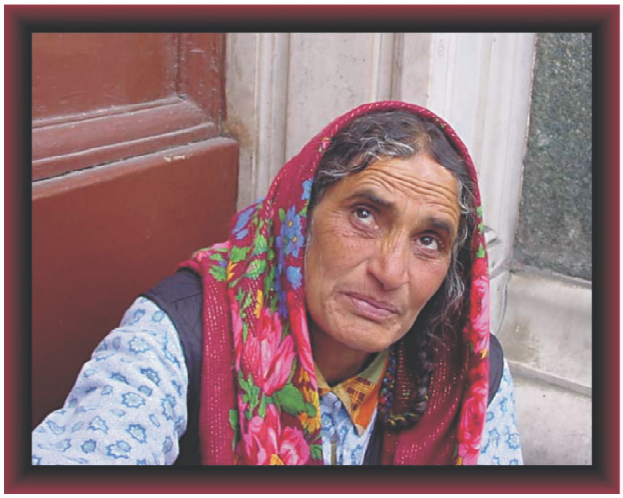


Fig. B:

Fig. C:

(See the two pictures above) You show picture A to your friend .Ask what the person sees ? Then present picture C and ask what the person sees. Your friend may say that picture A is of an old woman and C is also the picture of the same women. Ask another friend to see picture B and picture C one by one. Most likely s/he may say that both the pictures are of young girl. They are all correct in their perception. They see as they want to see. Again ask them to see each picture carefully. They may see changed face but the time taken to come over to recognise changed face would be different in different cases. Perception, in fact, is influenced by learning and experience. We perceive objects as per our needs and values. Psychological and physiological needs allow us to perceive things in our own way. A hungry person, for example, may perceive other objects as food items. Mc Clelland and Atkinson (1948), for example, have shown that persons who have not eaten for long periods display the 'mirage effect" of identifying hazy objects as food or eating utensils. Further, our perception is determined by our values. People tend to perceive an object larger whom they value more. Bruner and Goodman (1947), in a study, found that poor children estimated size of the coin larger than the rich children. The phenomenon of perceiving valued objects as larger or as more vivid than they actually are, is known as *perceptual accentuation*. It will now be clear that how attention, perceptual set and perceptual accentuation determine our perception by perceptual selectivity.

1.4.2 Perceptual Constancy

We see an object as we have image on our retina. When the object is closer we have full image of it on the retina. But when it moves far, the image becomes different yet we see the object in the same shape, size, colour and brightness. We see a white, bright, big and rectangular table in our front, we have an image of it on the retina. We move it further when only we can see just vague image of it. What happens then? Yet we perceive it as a table of the same size, shape, colour and brightness. The tendency of the individual to perceive aspects of the world as unchanging despite changes in the sensory input we receive from them is the phenomenon known as *perceptual constancy*.

Hastorf, Schneider and Polefka (1970) have given an example. You are sitting in a chair in your living room. A man walks into your room, moves over to a table by the window, picks up a news paper, and then goes across the room to sit down and read. What are the successive patterns of visual stimulation that register

on your retina as you watch this scene? Every time the man moves closer to you, the image on the retina gets larger. In fact, if the person moves from 20 feet away to 10 feet away, the height of the image on your retina doubles. The opposite occurs if the person moves away from you. In addition, as the person moves nearer the window, more light is available, and his image on your retina gets brighter. When the person moves away from the window, the image gets darker. Retina senses this way but what you perceive?. A changeable chameleon of a person who constantly gets larger and smaller, lighter and darker? Not at all. We see the person in the same way with no changes. This type of adjustment is due to perceptual constancy.

Perceptual Constancy is of four types – *size constancy, shape constancy, colour constancy* and *brightness constancy*. Perceptual size of an object remains the same when the distance is varied, even though the size of the image it casts on the retina changes greatly. This is *size constancy*. Two factors appear to produce size constancy – *size distance invariance* and *relative size*. While estimating size of an object, we take into account both the size of the image on the retina and the apparent distance of the object. This characteristic is known as size-distance invariance. When we are estimating size of an unfamiliar object we take into account the relative size of the object compared to objects of known size and it is the characteristics of relative size. These two factors determine mainly our size constancy.

The tendency to perceive a physical object as having a constant shape, even though the image on the retina changes, is known as shape constancy. You take a coin of circular shape and throw it in the air. Keep on looking at it and you will always see it circular although it casts different images on your retina. This is due to the perception of shape constancy.

Similarly we perceive objects as constant in brightness and colour, even though they are viewed under different conditions. Objects appear to be of same brightness no matter what the lighting conditions. Object maintains its colour no matter what the lightening or what other colours are near. Perceptual constancies are highly useful in our life. Had it not been so, we would have been badly engaged in managing various sensations and their impact on perceptual adjustment.. This way, the gap between our sensations and the perception managed by constancies is clearly beneficial.

1.4.3 Perceptual Organisation

In this world, for an organism there are three main perceptual questions and answers to these are key to its survival. What is it? Where is it? What is it doing? Gestalt Psychologists, first of all, studied perceptual organisation systematically and attempted to answer such questions. The process by which we structure the input from our sensory receptors is called *perceptual organisation*. Gestalt Psychologists advocated that we have tendency to perceive sensory patterns as well organised wholes rather than as separate isolated parts. Perceptual organisation is known as figure – background relationship. It means that we tend to divide the world around us into two parts: figure, which has a definite shape and location in space, and, ground, which has no shape, seems to continue behind the figure, and has no definite location. The segregation of figure and background can easily be seen in two dimensional pictures. You see the following picture in

which the bright splotch appears as the figure and darker region is perceived as background. Figure is cohesive and articulated where as background is relatively formless and appears to extend behind the figure. (Refer to figure below)

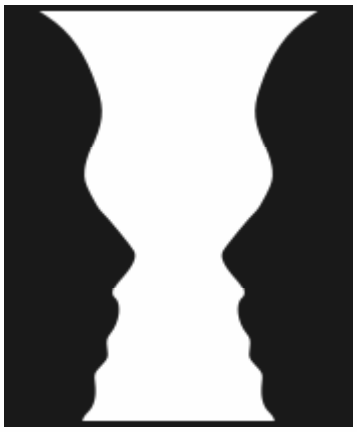
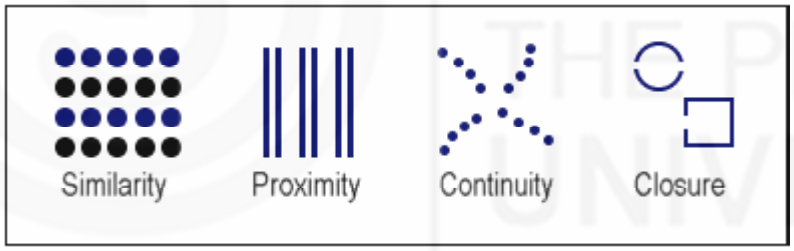


Fig. ground relationship

Figure: The figure – background relationship helps clarify the distinction between sensation and perception. Gestalt psychologists described some of the principles on which we group items together perceptually. These principles are known as the *laws of groupings*. This shows as to how perception is organised in daily life.Wertheimer (1923) regarded these laws as the laws of perceptual organisations. Some of these are: *law of proximity, law of similarity, law of good continuation, law of closure, law of simplicity* and *law of common region.* (See figure below)



Law of Proximity: We have a tendency to perceive objects located together as a group. The closer two figures are to each other (proximity) the more they will tend to be grouped together perceptually. a b c d e f. The low lines a, b, c, d, and e, f are perceived together as they are in proximity to each other.

Law of Similarity: We have a tendency to group figures according to their similarity.

+ + + + +

. . . . .

+ + + + +

. . . . .

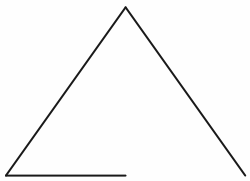
+ + + + +

. . . . .

Here, similar items as a group is perceived. This way, we organise different objects around us on the basis of similarity of physical or psychological properties.

Law of good continuation: The tendency to perceive stimuli as a part of continuous pattern is known as law of good continuation. Our visual system normally prefers contours that continue smoothly along their original course. Good continuation is a powerful organisational factor which prevails even when pitted against prior experience. In military setting, camouflage is achieved by using this law.

Law of closure: We have the tendency to perceive objects as whole entities, even some parts may be missing or obstructed from view. See this figure:



You will say it is triangle although it is not complete and lines at some points are missing. This is due to the law of closure.

Law of simplicity: The tendency to perceive complex patterns in terms of similar shapes is known as the law of simplicity. Individuals have a tendency to perceive objects and situations in a similar way so as to get maximum meanings without strain out of them.

Law of common region: We have a tendency to organise materials around us in a group to make them more meaningful and clear. This tendency of perceiving objects around a group if they occupy the same place within a plane is known as the law of common region.

These laws or principles of perceptual organisation are not hard and fast rules. These simply explain as to how we perceive world around us. We see objects in different forms. Perceptually, a form is experienced as a Gestalt, a whole which is different from the sum of parts. To perceive a form, we perceive certain relations among the component parts which remain intact despite alterations of the parts of a figure. Perception of depth is mainly explained by binocular disparity. Our two eyes look out on the world from slightly different positions, providing somewhat different view of any solid object they converge on. This binocular disparity normally induces perception of depth. This explanation provides the answer to the question as to how perception of third dimension takes place when we have image on our retina in two dimensions only. Perceptual organisation also explains how a light is seen travelling from one point to the other, even there is no stimulation (let alone movement) in the intervening region. It happens where right time-interval is placed among them. This phenomenon, apparent movement, is produced by the sequence of optical events. For example, light A flashes at time 1, followed by light B at time 2, then back to light A at time 3. If the time intervals are appropriately chosen, the perceptual experience will be of a light moving from left to right and back. This is how, perception of movement takes place.

1.5 LET US SUM UP

From the discussions provided earlier you must have understood as to how we see and feel meaningfully world around us. How sensation takes place and perception is managed in our daily life. With these two concepts we manage to live in the external world successfully. Sensation is the first experience of presence of objects around us and when we understand meaning of these, it becomes perception. For the whole process of understanding, the presence of the stimuli, sensory transmission and activities of the right part in the brain are essential.

1.6 UNIT END QUESTIONS

1) The relationship between sensory stimulation and its registration by sense organ is called:
   a) Perceptual accentuation
   b) Sensation
   c) Nerve fibers
   d) Perception
2) Fill in the blanks:

   Sensation of colour takes place by optic nerves called ..... and black, white sensation by ..... optic nerves distributed in retina.
3) Nearsightedness and farsightedness of vision is related to:
   a) Visual acuity
   b) Blind spot
   c) Physical energy
   d) Air pressure
4) The three bones ..... the malleus, the incus and the stapes are located in:
   a) Outer ear
   b) Middle ear
   c) Inner ear
   d) Cerebral cortex
5) Human olfactory receptors can detect only substances with molecular weights – the sum of the atomic weights of all atoms, in an odourous molecule – between:
   a) upto 10
   b) 350 to 450
   c) 15 to 300
   d) 500 to 600
6) Complete basic human tastes ave:
   a) Sour only
   b) Sweet and sour only

c) Salty only

d) Sour, sweet, salty and bitter

7) Skin senses are the outcome of :

a) Pressure only

b) Warmth only

c) Cold and pain only

d) Pressure, warmth, cold and pain

8) Kinesthetic senses provide information about:

a) Positions and movements of muscles only

b) Positions and movements of joints only

c) Positions and movements of objects only

d) Positions and movements of gravitation force

9) What is perceptual selectivity?

10) Perceptual set is:

11) Perceptual accentuation is:

12) Perceptual constancy is:

1.7 SUGGESTED READINGS

Carlon, N.R. (1998) *Physiology of Behaviour* (6th ed.), Needham Heights, M.A. Allyn & Bacon.

Hastorf, A.H., Schneider, D.J., and Polefka, J. (1970) *Person Perception*. Reading Mass: Addison - Wesley.

Munn, Norman. (1997). *Introduction to Psychology*. Holt Rinehart, New Delhi

References

Burner, J.S., and Goodman, C.C. (1947) Value and Need as Organising Factors in Perception. *Journal of Abnormal and Social Psychology,* 42,33-44.

Leeper, R. (1935) The Role of Motivation in Learning: A Study of the Phenomenon of Differential motivation control on the Utilisation of Habits. *Journal of Genetic Psychology*, 46, 3-40.

McClelland, D.C., and Atkinson, J.W. (1948) The effect of different intensities of hunger drive on perception. *Journal of Psychology*, 25, 205-222.

Siipola, E.M. (1935) *A* Study of Some Effects of Preparatory Set. *Psychological Monograph*, 46, 210.

Wertheimer, M. (1923) Untersuchungen Zur Lhre Von der Gestalt, 11, Psychologische Forschung, 4: 301-350.

UNIT 2 PSYCHOPHYSICS: THRESHOLD, SIGNAL DETECTION THEORY

Structure

2.0 INTRODUCTION

So far you have understood as to how you have sensation and perception of an object around you in the world. You are able now to distinguish between sensation and perception of an object. When stimulus is put through to a sense organ and you have a vague knowledge of presence of the stimulus, you have sensation of it. But when meaning is added to it, that is when you understand the real object, it becomes perception. You are now aware of the processes through which sensation converts into perception. But have you ever attempted to know as to how you feel different degree of sensation? For example you taste something and say 'a bitter taste'; get pressure on your body and say a 'dull pressure'; see an intense red colour and say a 'brightish red'. How have you been able to feel the different intensity of different sensations? This is interesting to know. The details of the sequence are very different for the different senses and the stimuli that normally excite them, in the receptors, in the qualities of their sensations are also different. This section of the study will help you in understanding answers of such process.

In fact, the sensory system does not respond unless the stimulus energy is above some critical level of intensity. The stimulus energy below the critical level of intensity does not produce sensation. The branch of knowledge which deals with such phenomenon is known as *psycho-physics*. You may have to be more careful in studying this section, which seems to be difficult but really *not at all* difficult to understand. You will learn in clear terms and simple language the processes of psychophysics and its different concepts. The concepts are *threshold – absolute*

threshold and *differential threshold*. The methods through which the thresholds can be determined are the method of *limits* and method *constant stimuli*. The laws which govern such phenomena include the *Weber's Law*, the *Fechner's Law*, and the *Steven's Power Law*. *Response bias* plays an important role in determination of, and response to, a sensation. *The signal detection theory* explains the impact of response bias in such sensations. This way, the finer distinction of sensation and its determination, you will be clearly in a position to understand. You will also be able to determine experimentally the intensities of sensations in comparable terms.

2.1 OBJECTIVES

After reading this unit, you will be able to:

- Define the concept of psychophysics;
- Define threshold and identify types of thresholds;
- Indicate the methods of determining the nthreshold;
- Explain Weber's Law, Fechner's Law, Steven's Power Law;
- Define response bias in determining sensations;
- Describe signal detection theory; and
- Identify signal detection and decision process.

2.2 PSYCHOPHYSICS

You have experience from different senses with details of the sequence very different from each sense but the path from stimulus to sensory experience is almost similar. Vision is different from taste or hearing but all these necessarily have three steps common in sequence, viz., (i) presence of proximal stimulus (ii) neural chain of events (nerve impulse, message to brain) and (iii) psychological response or sensation.

In this process, the message is often modified by other parts of the nervous system as well. Psychophysics studies the relationship between some property of the physical stimulus and the psychological consequence, that is sensory experience quite apart from the intervening neural steps.

The field, which tries to relate the characteristics of physical stimuli to attributes of the sensory experience they produce, is known as psychophysics.

You may easily measure the magnitude of the stimulus(physical) in terms of physical energy. For instance it can be done in kilos, in degrees centigrade, in inches, in decibels or whatever but it is difficult to measure quantitatively the psychological intensity or the magnitude of a sensation To measure magnitude of a sensation in quantitative terms several methods have been developed which are known as psychophysical methods.

2.3 THRESHOLD

The world around you provides many stimuli at a time but you do not respond to all stimuli, particularly those which are very low in intensity. Different types of

sensations need different intensity of stimuli for activation. Galanter (1962), for example, stated that we can hear a watch tick twenty feet away in a quiet room. We can detect the taste of a single tea spoon of sugar in two gallons of water. We can smell a single drop of perfume in an empty three-room apartment and on a clear dark night, we can see a dim candle thirty miles away. A question arises then that how much physical stimulation is necessary in order to experience a sensation? Normally we think that the relationship between stimulus intensity and sensation is direct , meaning that we always will have sensation when the intensity of stimulus is sufficient. But in a real life it does not happen. One reason may be that our sensitivity to external stimuli changes from moment to moment and in order to maintain the body's internal environment at optimal level the sensitivity of our sensory organs to stimuli varies. The sensory system will not respond unless the stimulus energy is above some critical level of intensity, the so-called *absolute threshold.*

Absolute threshold, therefore, is the smallest amount of a stimulus that one can detect 50% of the time.

Suppose one stimulus is presented to a person and of total number of trials the person is able to detect the stimulus 50% of the time, this point of detection is known as *absolute threshold.* This way, absolute threshold is the point where a person is able to detect the presence of the stimulus half of the times the stimulus is presented to the person.

Another point is important in sensation as to how one discriminates between two sensations. What is the minimal amount by which original intensity of a stimulus is increased so that it may have a changed sensation? Consider the sensation of visual brightness produced by a patch of light on the eye. To experience a sensation of brightness *just* greater than the previous one, how much minimal amount of light intensity patch is to be increased. Again, the changed brightness must be experienced by 50% of the times of presentation. This amount which makes a difference is called *difference threshold*. It produces a just noticeable difference, that is j.n.d. The j.n.d. indicates subject's capacity to discriminate.

The difference threshold is the amount by which a given stimulus must be increased or decreased so that the subject can perceive a just noticeable difference (j.n.d.) 50% of the times.

Take the example. You take a glass of water. You add a grain of sugar to it and ask the subject if the person is able to detect the sweetness. The response will be 'no'. Keep on adding grains to it. A point will come when the subject will say 'yes'. The *point* where the change is felt is *absolute threshold* and the *amount* added to it to feel a change to sweetness is the *difference threshold*.

2.4 PSYCHOPHYSICAL METHODS

The set of procedures through which sensory thresholds are determined is known as psychophysical methods. One method, the method of limits, works like this. Skin sensation may be determined by one apparatus aesthesiometer. It has two points which can be made longer and shorter. A particular area of hand is encircled and the two points of the apparatus is touched with equal pressure all the time.

The subject is blind folded and asked to report if it has sensation of one point or two points. Trials are taken in ascending and descending order. Ascending trials start with the presentation of the two points at minimum distance that is with sensation of touch of one point followed by increased distance between two points so that two points sensation is there.

Descending trials are taken in just opposite manner. They begin with sensation of two points followed by decrease in distance between two points of the apparatus so that the subject reports sensation of one point touch. Many trials are taken to get a correct estimate of threshold in ascending and descending order and average is taken out. It also takes into account the error of habituation and error of anticipation. A tendency, to say 'one point sensation' in ascending series and 'two point sensation' in descending series, independent of whether the subject actually feels the points, is known as the error of habituation. The people's tendency, to change response to the stimulus before actual feel of it, is known as the error of anticipation. The *point* where sensation of 'one point' converts into 'two points' sensation is the *absolute threshold*.

Another method is *method of constant stimuli.* This method is simple as well. The j.n.d. or difference threshold can be determined through method of constant stimuli. Take a set of weights with one standard stimulus and others comparison stimuli, say, 100 grams as standard stimulus and 84, 88, 92, 96 grams below the standard stimuli and 104, 108, 112, 116 grams above the standard weight as comparison stimuli. On each trial ask the subject to judge between the two weights – one standard and the other comparison ones and get response if comparison weight is lighter, equal or heavier to the standard one. Present all comparison weights with standard weight together one by one in a suitably designed manner. Finally, the number of grams that has to be added to create a just noticeable difference is found out. While conducting the experiment proper care is taken to present the comparison stimuli with the standard one in a way so that no error is effective in finding out *difference* threshold. This type of experiment can be conducted on many sensations adopting proper procedures.

These methods make assessment of psychological intensity, the magnitude of sensation, easy. It was believed by Fechner, the founder of psychophysics, that sensations cannot be compared to physical stimuli but they can be easily compared to each other. A person can compare two of his own sensations and judge whether the two are the same or different.

2.5 THE WEBER'S LAW

Gustav Theodor Fechner (1801-87), the founder of psychophysics, attempted to measure j.n.d. with a view to achieving a higher goal that is, formulation of a law relating stimulus intensity to sensory magnitude. Fechner was of the view that such a law could be built upon an empirical generalisation first proposed by E.H. Weber (1795-1878), a German physiologist, in the year 1834.

Weber gave the observation that the size of the difference threshold is proportional to the intensity of the standard stimulus. This ratio is constant. The size of the difference threshold, a constant ratio of the standard stimulus, is often referred to as *Weber Fraction*. This example will make this law more clear. Suppose that you can just tell the difference between 100 and 104 grams then you will be able

to just distinguish between 200 and 208 grams, 400 and 416 grams and so forth. Fechner labelled it as Weber's law which is algebraically put as

$DI/I = C$

Where

DI is the increment in stimulus intensity (i.e. the j.n.d.)

I is the stimulus intensity (the standard stimulus)

C is constant

Many studies were conducted in the past to see whether Weber's law holds for all of the sensory modalities. It was verified in most of the cases except a few where the nervous system geared to notice relative differences rather than absolute ones. This law allows us to compare the sensitivities of different sensory modalities. Suppose you want to know, whether eye is more sensitive than the ear. This can be seen using Weber's law. If Weber's ratio is small, the discriminative power of the sense modality is great and vice-versa. This law helps in understanding the salient features of different sense modalities. It has been found out, using this law, that humans are keen in discriminating brightness than loudness, the Weber's fraction being 1/62 and 1/11 respectively.

2.6 FECHNER'S LAW

You have seen that Weber's law postulates that the more intense the stimulus, the more the stimulus intensity needs to be increased before the person gets a change. Fechner, with a number of assumptions, generalised Weber's findings which indicated a broader relationship between sensory and physical intensity. Fechner's law stated that the strength of a sensation grows as the logarithm of stimulus intensity. The formula is

$S = K \log I$

Where S is psychological (i.e. subjective)

Magnitude

I is stimulus intensity

K is constant

Fechner's law makes good biological sense as our nervous system compress huge rage of sensation awareness into some manageable scope, and this is what a logarithmic transformation does for us.

2.7 STEVEN'S POWER LAW

You have so far come to know that area of psychophysics concerns the relationship between stimulus intensity and sensory magnitude. Fechner, extending Weber's law, believed that general equation, with logarithmic relationship, does exist that holds good for all senses.

Fechner stated that the scale of subjective sensory intensity has almost the same properties which characterize physical dimensions, the unit of subjective sensory intensity being j.n.d.

Weber's law tells us that each just noticeable stimulus increment is a constant fraction of the stimulus to which it is added. The sensations go up by an arithmetic

series and the stimuli by a geometric series, therefore, we must mark off ever-larger intervals on the physical scale to correspond to equal intervals on the psychological dimensions. Woodworth (1938) stated as follows: "the sensation plods along step by step while the stimulus leaps ahead by ratios."

Fechner's formulation was very influential but a question was there. Is it that sensory magnitude can only be assessed indirectly as Fechner had claimed? To answer this question, a Harvard Psychologist S.S. Stevens (1906-1973) provided one straight forward method. He asked subjects to estimate sensory magnitude *directly*. In his method, a series of stimuli were presented to subjects and they were asked to assign numbers that were proportional to the corresponding subjective impressions. Thus, if one tone sounds three times louder than another, the subject had to assign a number to the first that was three times larger than the number given to the second. (Stevens, 1961).

Two points were special to it. (i) The subject had little trouble in performing the task. They could judge their own subjective experience on a direct scale of subjective magnitude. (ii) The relation between this scale and physical intensity, as Stevens found out, was not logarithmic.

Hence Stevens conceived a power function, the formula being

$S = kI^N$

Where – S stands for subjective magnitude
I for stimulus intensity
k and N are constants.

This exponential function asserts that the intensity of a sensation is proportional to stimulus intensity raised to a certain power. When N is smaller than I, sensation grows more slowly than stimulus intensity and when N is larger than I, sensation grows more rapidly than stimulus intensity. Nervous system plays an important role in its compression or expansion. Let us take an example of sensation of pain by electric shock. Here the organism is better served by expansion than by compression. When the stimulus is quite intense, even a small increment in its intensity may spell difference between survival and destruction. Expansion of the subjective scale incites the victim to escape before serious harm is done. A look into the development of methods to measure sensation quantitatively from Weber to Stevens would reveal that these were great contributions to the field of Psychology. Until the middle of 19th century, scientists had despaired of ever measuring psychological processes. But Fechner showed the way and now we are in a position to measure sensation more accurately in quantitative form.

2.8 RESPONSE BIAS

You ask a person to lift different weights of different magnitude. If the difference is very little between the two weights, it will be difficult for the person to say exactly whether both are equal or one is heavier or lighter than the other. In such cases, attitudes and beliefs of the person play an important role in responses. One may say most of the time equal or heavier or lighter apart from the magnitude of the stimulus. The response is not correct in such cases, hence, real threshold cannot be found out. Always responding equal or heavier or lighter of the stimulus, although not really in sensory sensitivity, is *response bias*.

Take another example. You present a very weak tone to a blind folded subject and ask whether it is audible or not. Since the tone is very weak in magnitude, it will be difficult to take a correct decision. The person may approach the task with a free and easy attitude cheerfully offering 'yes' response, and a 'no' response following conservative line whenever in doubt. The response will depend on the attitude of the person. You, therefore, will not be able to get a correct threshold determination. Early psychophysicists tried to cope with this problem by using subjects who were highly trained observers. To find out response bias in such studies experimenters used to throw in occasional *catch trial* on which there was no stimulus at all (Woodworth, 1938). This way, this type of error in response was detected and counterbalanced.

2.9 SIGNAL DETECTION THEORY

Recent development in psychophysics takes suitably the problem of response bias attitude in sensory experience. Green and Swets (1966) described *detection experiment* on the basis of which a theory was developed known as 'signal detection theory'. This theory suggests that these are no absolute thresholds for sensations. Rather, detection of stimuli depends on their physical energy and on external factors such as the relative costs and benefits associated with detecting their presence.

Signal detection theory has a somewhat different testing technique in which catch trials are a regular part of the procedure rather than just an occasional check to keep the subjects on their toes. To know whether the subject can detect the presence of a stimulus, a fairly weak stimulus is selected and presented on half of its trials. On the other half of the trials 'no stimulus' is presented.

Both the stimuli that is the 'weak stimulus' or 'no stimulus' are presented in random order. Two kinds of errors may be committed by the subject. One is a 'miss', not reporting a stimulus when present; another is a 'false alarm', reporting a stimulus when, in fact, not present.

Two kinds of correct responses may also be given. Reporting a stimulus when it is actually present 'hit' and not reporting it when none is present 'correct negative'.

The detection experiment gives a basis for getting at the non-sensory factors underlying response bias. One is differential payoff based on 'payoff matrix'. That is , in this you pay a subject for every 'hit' and 'correct negative' and penalise for every 'miss' and 'false alarm' as per prescribed schedule of gains and losses. This is called 'payoff matrix'. The four possible outcomes of the detection experiment are:

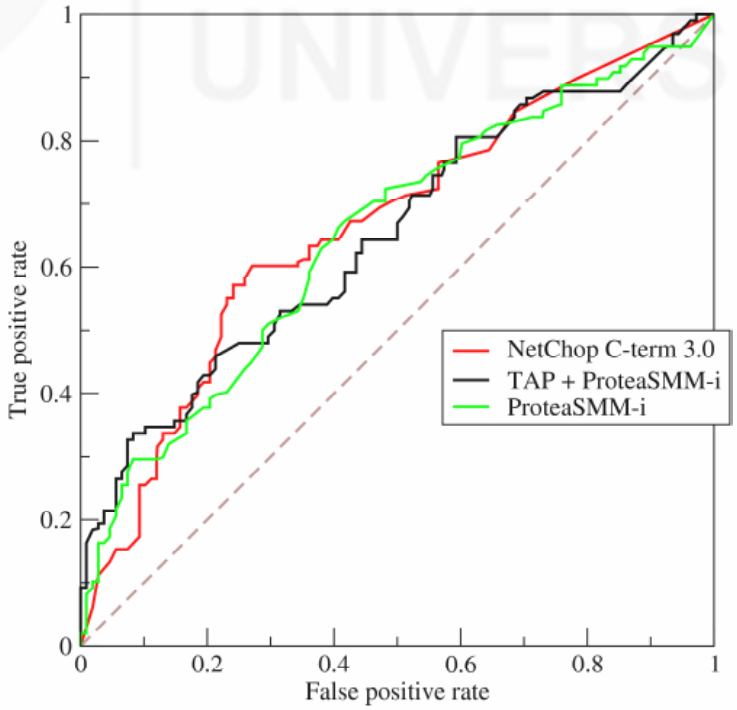
	Responds Yes	**Responds No**
Stimulus present	Hit	Miss
Stimulus absence	False alarm	Correct negative
	Subject says 'yes'	**Subject says 'no'**
Stimulus present	+10 Rs. (Hit)	– 10 Rs. (Miss)
Stimulus absence	– 1 Re. (False alarm)	+ 5 (Correct negative)

The 'pay off matrix' where the subject gains Rs. 10/- for every 'hit' and Rs. 5/- for every correct negative; loses Rs. 10 /- . for every 'miss' and Re. 1/- for every 'false alarm', This will ; will lead to a 'bias' toward 'yes' judgements. With this payoff matrix, the subject will do well to adopt a liberal criterion and give a 'yes' judgement whenever the subject is in doubt.

Take for instance an example, Suppose in such an experiment, on 50 trials the subject has no sensory information on the basis of which she can decide whether the stimulus is present or absent. If she consistently says 'yes' she will be on the average be correct on 25 trials (thus collecting Rs.250/-) and wrong on the other 25 (thus losing Rs.25/-) and her net gain will be Rs.225. In contrast, consistent 'no' judgements will lead to a net loss of Rs. 125.00 (+ Rs. 125 for the correct negative and – Rs. 250 for the false alarm). If the stimulus is presented half of the trials, the payoff bias can be calculated easily by comparing the sum of the values under the 'yes' column with the sum under the 'no' column. In the example presented, these sums are +9 Rs. and – 5 Rs. respectively. This way, the subject will adopt a liberal criterion and give 'yes' judgement even if she is in doubt.

2.10 THE ROC CURVE

With the help of the Receiver-operating-characteristic curve (ROC) sensitivity and response bias is separated. The first step in the experiment is to vary response bias while keeping sensitivity constant by changing payoff matrix. Another way is to vary the proportion of trials on which 'no stimulus' is presented – the four such trials, the greater the 'yes' bias. When subject is more conservative, thee appears a reduction in the proportion of trials on which one is guilty of false alarm. At the same time there is a reduction in the proportion of hits. This effect can be plotted of the two proportions against each other. This is ROC curve. (See the figure below)



The next step is to get the index of sensitivity which is not contaminated by response bias. For separate detection experiment separate ROC is plotted. The

stronger stimulus, the more its ROC curve is bowed away from the main diagonal. The displacement of the ROC curve from the main diagonal provides a pure measure of sensitivity for the stimulus on which the ROC curve is based; it is measured along the second diagonal.

2.11 SIGNAL DETECTION AND DECISION PROCESS

Why a person gets so much of difficulty in distinguishing between the presence and absence of a stimulus? Signal detection theory provides a satisfactory answer. This theory states that there really is no such thing as zero stimulus. It assumes that psychophysical judgements are based on some underlying neural activity to the sensory system which may vary in magnitude. Normally, it is believed that sensory process takes place by an actual external stimulus. But this theory postulates that sensation can take place even in the absence of any external stimulus due to *background factors*. Hearing, for example, can take place even if no actual sound is produced. There is spontaneous activity in the nervous system which can produce sensation of hearing. So sensation is the product of both the presentation of the external stimulus and also background factors i.e. mental states. This way, signal detection theory provides more effective explanation of sensory process and its measurement.

2.12 LET US SUM UP

You have come to know by how that the founder of psychophysics, G.T. Fechner studied sensory intensity by determining the ability of the subject to discriminate between stimulus intensities. Important measures to it are the absolute and difference thresholds. The difference threshold is the change in the intensity of a stimulus that is large enough to be detected at least 50% of the presentation. The absolute threshold is the lowest intensity of the stimulus that produces a response. Weber's law indicated that the difference threshold or the j.n.d. is a constant fraction of the intensity of the standard stimulus. Fechner explored wider relationship which states that the strength of the sensation grows as the logarithm of stimulus intensity. Stevens extended the work further and stated that it was possible for subjects to deal with sensations head-on and to scale them directly. Response bias indicated the role of attitudes and beliefs of subjects due to which subjects fluctuate in their reactions to the same physical stimulus intensity. Signal detection theory asserts that observers who are asked to detect the presence or absence of a stimulus try to decide whether an internal sensory experience should be attributed to background noise or signal added to background noise. Payoff matrix helps in determination of such situations. Decision process, according to signal detection theory, is influenced by sensory process even if there is no such thing as zero stimulus.

2.13 UNIT END QUESTIONS

1) What is psychophysics?
2) What is absolute threshold?
3) What is difference threshold and absolute threshold?

4) Weber's law is: .....

5) Fechner's law is: .....

6) Steven's law is: .....

7) What is response bias: .....

8) What is signal detection theory?

9) Payoff matrix: formulation

10) How signal detection theory helps in understanding the decision process?

2.14 SUGGESTED READINGS

Galanter, E. (1962), Contemporary Psychophysics. In R. Brown, E. Galanter, E.G. Hess & G. Mandler (Eds.), *New Directions in Psychology*. New York: Holt, Rinehart & Winston.

Green, D.M., and Swets, J.A. (1966). *Signal Detection Theory and Psychophysics*. New York: Wiley.

Woodworth, R.S. (1938), *Experimental Psychology*. New York: Holt.

Robert Sessions Woodworth (1999). *Woodworth & Schlosberg's Experimental Psychology*, Holt Rinehart and Winsoton, New York,

UNIT 3 THE VISUAL SYSTEM: WAVE LENGTH, AMPLITUDE, STRUCTURE OF THE EYE, COLOUR VISION THEORY, ILLUSION, PERCEPTION OF PAIN-PHANTOM LIMB EXPLANATION

Structure

3.0 INTRODUCTION

So far you have been able to understand some of the salient features of sensation, its measurement and also some aspects of perception. This chapter will explain some more important aspects of human adjustment pattern. The visual system is the greatest gift, you have, in your life. Much researches have been done in this field from the beginning to ascertain facts about it. Light is the physical stimulus for vision. You see through the eye. Acuity, dark adaptation, eye movements and brain, manage the visual system. You see colours present in the world around you. Some of the things, so far, you have come to know in previous chapters. In this chapter you have some more details of visual system and its management. You will be able to know the structure and function of the eye, phenomenon of colour vision, classification of colour sensation, colour blindness etc. Sometimes we have false perception of the stimulus around us. This is known as illusions. You will learn about illusions as well. Pain is very common in our life and every body experiences pain of different types at one or the other point of time during

life time. How pain is perceived? You will have scientific explanations to it. These all aspects are related to our successful living. You will, therefore, be interested to know about it. This way, the facts stated in this chapter will be of great help in personal adjustment and successful living.

3.1 OBJECTIVES

After reading this unit, you will be able to:

- Explain the phenomenon of visual system as a whole;
- Identify structure and functions of the eye;
- Describe the phenomenon of colour vision and its explanation;
- Define illusions; and
- Elucidate perception of pain and its different scientific explanation.

3.2 VISUAL SYSTEM

You may have experience of traveling in a car during night hours on a road in a big city. You may see light from another car coming towards you from the head-light of the car. And also, in dark period you may see some lights emitting from the stone-like-object put on the middle of the road in a line dividing the area of the road into two parts. Visual sensation of these depends on some external object. It may mainly be of two types – one light source, which emits light in its own right, like light bulb and the other objects which reflect light if some light source illuminates them.

The first category of objects produces light on its own and the second category *reflect* some portion of the light cast upon them while absorbing the rest. Light, therefore, is the physical stimulus for visual sensation. Our visual system is sensitive relatively to small band of radiations. Like the stimulus of hearing these light radiations travel in a wave form giving rise to visual sensation. The amount of radiant energy in unit time is called *intensity*. The intensity determines the characteristics of brightness. The distance between the peaks of two successive waves is known as *wavelength*. Variation in wavelengths is a major determinant of perceived colour. We have a *visual spectrum,* the range of wavelengths to which our visual system can respond. Visual spectrum extends in human from roughly 400 (violet) to about 750 (red) *nanometers* between the two peaks. One nanometer is equal to one millionth of a millimeter. In between violet and red, we see blue (shorter wavelengths), green, yellow and orange (medium wave lengths). The names of the colour are known as *hue*. Our experience of *saturation* is determined by the number of wavelengths the light contains. Fewer the number of wavelengths mixed together result in more saturated or pure colour. Higher the number of wavelengths mixed together produce less saturated colour. The three characteristics of visual sensations are determined by intensity of light waves and its wavelength. These are *hue* (the colour that we experience due to the dominant wavelength of light), *saturation* (the degree of concentration of the hue of light) and *brightness* (the physical intensity of light), The height of the wave is amplitude.

3.2.1 The Structure of the Eye

The main organ of visual sensation is the eye. The physical stimulus (light) is received by the eye first of all. The eye works like a camera where the light passes through a small hole reaching a lens that focuses an image on a photosensitive surface. In the eye, light first passes through the *cornea*, a transparent protective cover over the front part of the eye. Next it passes through the *pupil*, an opening that can be widened or narrowed, and get more or less light in by contractions in the muscles of *iris*, the coloured part of the eye. Through the pupil light passes to the *lens*. Lens adjusts itself to bring far or near objects into focus of the *retina*, situated at the back of the eye ball. It is accomplished by a set of muscles that change the shape of the lens. It is flattened when the object is at distance and thickened for objects nearby, a process known as *accommodation*. All major structures of the eye, except retina, have nothing to do with the *transduction* of physical energy into neurological terms. These structures simply arrange proper proximal stimulus for vision, a sharp retinal image; out of the light that enters from outside. A portion of the retina that contains only cones and that is particularly receptive to colour is *fovea*. The structure of eye is given below.

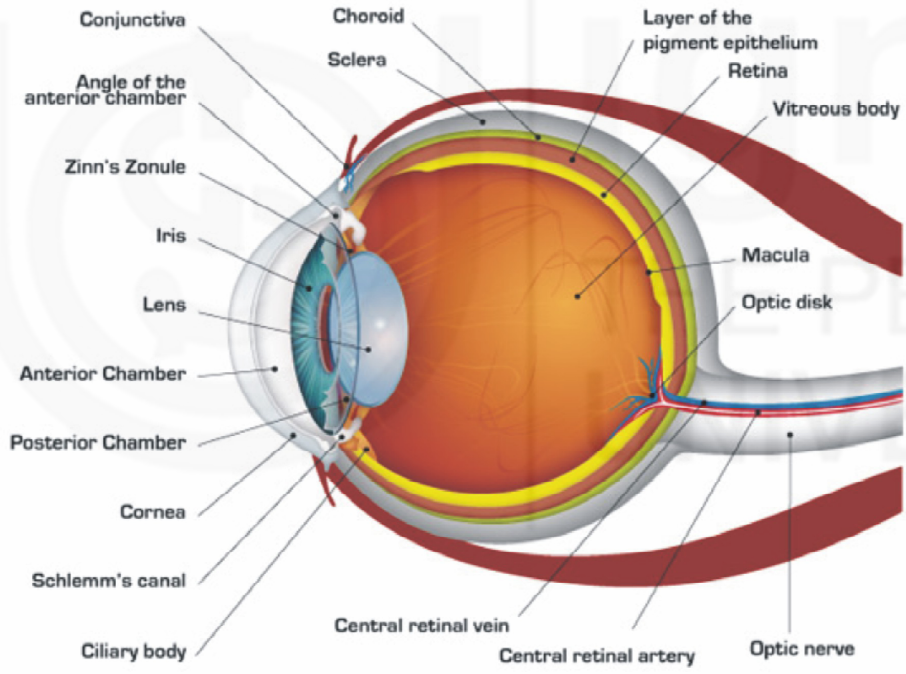


Fig.3.1:

The lens bends light rays in such a way that the image projected in the retina is reversed i.e. up- side down; but the brain reverses the image letting us see objects and people correctly. Coren, Ward and Enns (1999) stated that the retina contains two types of light sensitive receptor cells; about 5 million *cones* and about 120 million *rods*. *Rods* are slim nerve cells; *cones* are thicker, with a cone-shaped tip at one end. Both the types of cell contain chemicals that are sensitive to light. Light striking a rod results in the breakdown of a chemical called rhodospin (Visual purple) and the cones contain different photo sensitive chemicals, which break-down when struck by other light waves. These processes trigger activity in the optic nerves, and, subsequently in the brain. The rods are located mainly at

the edges of the retina and are colour blind. It does not give sensation of colours. Colour receptors are *cones* and it is situated together in the centre of the eye. On retina, behind the lens, millions of *cones* are placed on the *fovea*. Some *cones* are, however, mixed with *rods* all the way to the outer edges of retina but the centre of the eye is the most colour sensitive portion.

The cones adapt quickly in the dark is about ten minutes and *rods* adapt slowly. When completely adapted, the *rods* are much more sensitive to light that the *cones*. Visual sensation takes place only when the information is sent to the brain. The receptors do not report to the brain directly and it is done through neural links – the *bipolar cells* and *the ganglion cells*. The bipolar cells are stimulated by receptors and each bipolar cell responds to only one *cone* in the foveal region. The ganglion cells, situated in the last layer of the retina, are excited by the bipolar. The axon of the ganglion cells are collected from all over the retina and converge into a bundle of fibers that finally leaves the eyeball as the *optic nerve*. The area where these axons converge contains no receptors and can not give rise to visual sensation. This location is known as *blind spot*.

The retina, this way, has three main layers: the *rods* and *cones* (photoreceptors); the *bipolar cells* and *ganglion cells* (whose action make-up the optic nerve). Photoreceptor cells are the very back, the bipolar cells are in between and the ganglion cells are at the top. The *Fovea* is the region on the retina in which the receptors are most densely packed. The *blind spot* is the region where there are no receptors at all, this being the point where the optic nerve leaves the eye ball.

3.2.2 Functions of Visual System

You have known now the structure of the eye, the main organ of visual system. But how it gets the finer details of an object? The ability to see fine details of an object is known as visual acuity. To improve visual acuity one wears either eye-glasses or contact lenses. Some surgical procedures are available to improve visual acuity. With the help of a computer-controlled ultraviolet beam, a surgeon, reshapes the cornea to be able to get finer distinctions of the object. This surgical procedure is known as LASIK. Rosenfeld (1999) reported that through this surgical procedure as many as 80 per cent obtain 20/20 vision. The ability to discriminate the details in the visual field, the visual acuity, is normally ascertained by using the familiar eye chart. You must have seen it in the clinics of the eye surgeons. Near- sightedness or farsightedness is treated for visual acuity. This acuity is of two kinds. The ability to discriminate different objects when they are in stationary or static position (example: chart at an eye surgeon's office) is known as static visual acuity (SVA). Dynamic visual acuity (DVA), another kind, is the ability to the details when the test object and/or the viewer is in motion. Normally, the speed at which an object's image moves across the retina (the angular velocity) increases, the capacity to discriminate objects decreases.

Another basic function of vision is *dark adaptation*. You have known the basic process of dark adaptation in the one section of the block. The dark adaptation, according to Matlin and Foley (1997), takes place in two steps. First, within five to ten minutes, the *cones* reach the maximum sensitivity and in the second step, after about ten minutes, the *rods* begin to adapt and total process is complete in about thirty minutes.

Eye movements also play an important role in visual acuity. If eyes are struck in one position while reading a news paper, you can imagine how much difficulty you will face in reading. You will always move your head to read a piece of news at different places. Eye movements are of two types (i) *Version movements,* in which both the eyes move together in the same direction; and (ii) *Vergence* movements, in which the lines for sight for the two eyes converge or diverse.

The *Version movements* are of the three types (i) *involuntary movements, (ii) saccadic movements,* and (iii) *pursuit movements.*

You have perception of distance and depth through *vergence movements*. You have one experience on your own. While reading something stop at one place and stare at the word for several seconds. Did your eyes remain motionless or did they move about? It may have moved. This movement is *involuntary* i.e. without your conscious control. If involuntary movements do not occur, it will result in temporary blindness whenever you fix your gaze on any object for several seconds. This way, it helps in maintaining visual sensation.

Saccadic movements are very fast, frequent jumps by the eyes from one fixation to another. It helps in car driving or reading. Such fixations tend to be shortest for short, predictable objects that occur frequently. This way, quick movements of the eyes from one point of fixation to another is called *Saccadic movements.*

The *pursuit movements* are smooth movements used to track moving objects like flying of a plane overhead and out of sight.

The vision is received through the eyes but processed in the brain. Process at brain is not simple. Hubel and Wiesel (1979) conducted studies on *feature detectors* — neurons at various levels in the visual cortex — that respond primarily to stimuli processing certain features. Three types of feature detectors were found — *simple cells, complex cells* and *hyper-complex cell*.

Simple cells respond to bars or lines presented in certain orientations (horizontal, vertical and so on), complex cells respond maximally to moving stimuli and hyper-complex cells to even more complex features of visual world viz., shapes, corners, angles etc. According to this view, groups of neurons analyse simple aspects of visual information and send their outcome to other groups of neurons for further action.

At further stages increasingly complex visual information is analysed and compiled — eventually producing the coherent flowing scenes that constitute of perception of the world around us (Zeki, 1992).

There are other types of evidences which show the role of cortex in vision. *Blind sight*, for example, is a rare condition resulting from damage in the primary visual cortex in individuals report being blind. Such people respond to certain aspects of visual stimuli as if they could see.

Prosopagnosia, a rare condition, in which brain damage impairs a person's ability to recognise faces but still retain relatively normal vision in other respects.

These findings lead us to believe that visual system is quite selective, and 'seeing' is a complex process — one that requires precise integration across many levels of our visual system.

3.2.3 The Duplicity Theory of Vision

The idea that *rods* and *cones* handle different aspects of the visual task resulted in a theory of vision known as the *Duplicity theory*. Rods are the receptors for night vision, as they operate at low light intensities and provide achromatic (colourless) sensations.

The *Cones* help in seeing mostly in day-time when illumination is at the higher level. *Cones* are responsible for colour sensations. The details about the functions of the *rods* and *cones* you have already known in earlier discussion. The sensitivity of rods and cones can be determined experimentally adopting measurement of thresholds. This theory is now an established fact.

3.2.4 Colour Vision

You can see the *spectrum* of colour if allow to pass sunlight through a prism. The rays of light converts into bands of red, green, yellow and blue. Colour gives pleasant experience, that is why, you love seeing colours in the world. You also know that colour sensation depends on the cones situated in the retina and range of wavelengths determines different hues (*blue* - 400-500 nanometers; *Green* - 475-600 nanometers and *red* - 490-650 nanometers). Do you think that all people of the world do see all colours? The answer is 'no'. Haber and Fried (1975) reported that about 7 per cent of the people in the world can not see one or more colours. Nathans (1989) stated that nearly 8 per cent of males and 0.4 per cent of females are less sensitive than the rest of us either to red and green or to yellow and blue.

The most common type of colour blindness is *dichromatic*. In such cases, colour vision is normal in two of three primary colours and deficient in the third as one of the three cones in retina is either deficient or missing. In red-green deficiency dichromatic colour blindness, for example, people see the world almost entirely in blues and yellows. A red building appears like dull yellow and grass as blue.

Similarly, people with yellow-blue colour blindness, in contrast, sees the world as red and green. Haber and Fried (1975) further stated that red-green colour blindness is by far the most common than the blue-yellow colour blindness. Graham and Hsia (1958) gathered evidence from rare cases in which individuals have normal colour vision in one eye and impaired colour vision in another. One such woman revealed that to her colour-impaired eye, all colours between red and green appeared yellow, while all colours between green and violet seemed blue.

People with achromatic colour blindness see only black and white, the shades of grey as they do not have cones in retina. Colourblind people may not have all similar experiences which normal people do have but they function quite well without colour cues. Some people even may not know that they are colour blind. These people manage between colours through perceived brightness and other cues. Special tests are available to determine colour blindness in people. Most commonly these tests consist of buried figures composed of dots of different colours but of equal brightness surrounding dots.

3.2.5 The Dimensions of Colour

How do we discriminate different colours? We discriminate colours on three different dimensions, viz., (a) *hue, (b) saturation,* and *(c) brightness*. *Hue* is a term whose meaning is close to the word that of the colour as used in daily life. It is the property of the chromatic colours (such as red and blue) but not of the achromatic colours (such as black and white). Hue varies in wavelength. Above the wavelength about 700 nanometers we have infra red which we do not see. Similarly, below the wavelength about 400 nanometer we have ultraviolet rays which we do not see.

The visual spectrum, therefore, ranges in between about 700 nanometer and about 400 nanometer. The unique blue (a blue with no trace of red and green in it) occurs on the visual spectrum at about 475 nanometers, unique green (with no blue or yellow) at about 515 nanometers and unique yellow (which has no green or red) at about 580 nanometers. *Brightness* varies in both chromatic and achromatic colours.

Ultramarine is darker than light blue and charcoal grey is darker than light grey, both may have same amount of brightness. The white and the black represent the top and the bottom of the brightness dimension. The amount of light reflected from the colour determines the amount of brightness. A dull colour may have more brightness if the light reflected is more than that of the deep colour. *Saturation*, is the purity of a colour. The more grey (white or black) is mixed with the colour it results in less saturation. When the colour is entirely grey, it has zero saturation. The colour perception therefore is the outcome of the three characteristics of the colour-hue, saturation and brightness.

3.3 THE THEORIES OF COLOUR VISION

There are two leading theories to explain our colour sensation. Long ago, Young-Helmholtz proposed the sets of colour perceiving elements in retina. These are *red, green* and *blue*. Perception of these colours arises from the combined stimulus of three elements; deficiency or absence of any one of these elements result in inability to perceive that colour and a misperception of any other colour or its part. Similarly, Hering, long ago, proposed a theory in which it was stated that there are three opponent visual process: blue-yellow; red-green; and white-black. The two leading theories of colour vision, you will know about are: (1) Trichromatic theory, and (2) The Opponent process theory.

3.3.1 Trichromatic Theory

This theory postulates that we have three different types of cones in our retina and all are very sensitive. These cones give rise to the sensations of the three primary colours i.e. red, green and blue. Sensation of other colours is the product of the combination of these three primary colours.

Each of the three cone types is a *broad-band receptor*. Each responds to a very broad range of wavelengths in the visible spectrum. The main difference between these three cone elements is in their sensory curves. According to trichromatic theory, the ability to perceive colours results from the joint action of the three receptor types.

The light of a particular wavelength stimulates all the three receptors and the outcome is that colour vision takes place due to overall pattern of stimulation. The differential sensitivity may be due to genes that direct different cones to produce pigments sensitive to red, green or blue. (Nathan, Thomas and Hogness, 1986).

This theory, however, does not provide satisfactory answers to all kinds of colour phenomena. Let us do a small exercise.

You stare at a red object for sometime and quickly shift your gaze to a neutral background. You may have, then, sensation of green. This phenomenon is known as negative after image. In a colour sensation when you have one sensation, and, you shift the gaze, you may have another sensation of the complimentary colour of the one which you had stared earlier. In this case, you had another sensation of green, the complimentary colour of the red which you stared earlier. The same may be true for the yellow-blue complimentary group.

Let us see how this has happened. According to this theory if different cones are responsible for colour sensations, then such things can happen.

3.3.2 The Opponent - Process Theory

Nineteenth century visual psycho-physiologist, Edward Henry proposed that these are six primary colours — red, green, yellow, blue, white and black. It further assumed that there must be six different neural processes which correspond to each. The six processes are not independent but are organised in three opponent - process pairs - red-green; yellow-blue; and white-black. Hurvich and Jameson (1957) adopted Hering's theory and developed opponent. Process theory more appropriately. This theory explains all the characteristics of colour vision viz., hue, saturation and brightness in clear cut manner.

Hue, as per this theory, depends upon two of three opponent process pairs, that is red-green and blue-yellow. It can be understood by comparing it to a balance scale. In a physical balance, if one arm goes down, the other goes up. The hue, we actually, see on that position is of the two balances. If the red-green balance is tipped towards red and blue-yellow balance towards yellow, then the perceived hue will be orange, a resultant of red-yellow combination. If both the antagonists are balanced then no hue will be perceived. Both are, in their state, stimulated equally and cancels the effect, therefore, hue is not perceived and the impact remains achromatic.

Hurvich and Jameson (1957) developed a procedure to assess the impact directly using different wavelengths of light. They determined the extent to which any given wavelength affects either the yellow-blue or the red-green process. The extent to which the yellow-blue system is affected was measured by the intensity of blue required to cancel the yellow or yellow needed to cancel the blue. The same process was shown for the red-green opponent process pairs. This way, this theory clearly measured the opponent process leading to perception of a colour or hue and also the condition where hue is clearly not perceived.

According to this theory, black-white system of vision is determined by the activity of the third pair of antagonists, black and white. This way, *brightness* is determined. Every wavelength contributes to the excitation of the white system,

in proportion to its intensity and the sensitivity of day light of vision to this point of the spectrum.

The black process is produced by inhibition of the antagonistic white process. *Brightness Contrast* is the best example of it. You may also experience it. Put a black paper against a dark-grey background. How does it look? Perhaps as darker shade of grey is there and not black. You put the same black paper against a brilliantly illuminated background. How does it look now? Perhaps it will look pitch-black. In this case, white process within the enclosed region is inhibited resulting in enhancing the activity of the antagonist.

Saturation, according to this theory, depends upon the relationship between the activities of the two hue-systems on the one hand and black-white system on the other. Maximum saturation will take place when one or the both hue-systems are titled all the way keeping black-white system in equilibrium. Saturation will start lowering as the hue systems move closer to equilibrium. If you wish to neutralise red and blue, as per this theory, add green and yellow. The swing will be towards equilibrium and resultant as less saturation. If you radically tilt the black-white system to either side to white by increasing the stimulus intensity or to black by adding white light to the stimulus surrounding area - the saturation will decline.

The opponent process theory of colour vision explains clearly the facts of *negative after image* and *chromatic contrast*. Activation of the red mechanism is one retinal region presumably inhibits red process in neighbouring areas, thus tilting the red-green system towards green. The same process is true to *negative after image* explanation. Viewing of a red light produces inhibition of its green antagonist and when the red light is withdrawn, the green process rebounds.

When the opponent process theory was advanced in the beginning, it was considered as an *inference* based on perceptual phenomena of colour vision. But today there are solid evidences to prove that this theory is based on neuro-physiological mark. Experiments with single-cell recording in the retina or higher up show that some neurons behave very much as an opponent process theory as expected.. This is supported by De Valois (1965) who conducted experiments on rhesus monkeys, whose colour vision is known to be similar of humans.

3.4 ILLUSIONS

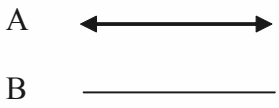
You may have known about same great magicians of the world like P.C. Sarkar and others who can make us perceive an object as they want us to see. They are, in fact, masters of illusion and can produce a situation where false-perception occurs. Perception helps us to see coherent picture of the world around us. But sometimes, perception provides false interpretation of sensory information and this false perception is known as *illusions*.

Matlin and Foley (1997) described two types of illusions (i) those due to physical processes and (ii) those due to cognitive processes. Illusions due to physical stimuli occur when ambiguity is there in stimulus situation. You may, for example, see water like things on the dry road ahead which is not there. This is due to ambiguity in stimulus situation at that moment which leads us to false perception.

Many illusions are related to cognitive area. The important ones relate to shape and size. But in any case, the object is present in an illusion which is misperceived and misinterpreted. A well known example is of *moon illusion*. A moon looks comparatively larger at the horizon than it does when up in the sky, even though the retinal image in both the cases is the same. The reason assigned to it is that the horizon looks farther away than the overhead sky and perceptual system compensates for perceived distance.

Kaufman and Rock (1962) conducted an experiment to test this hypothesis where subjects were shown artificial moons through special optical devices. They experienced the standard *moon illusion* where the size was greater, the farther off the visible horizon appeared. The size-distance hypothesis was verified.

One of the best known illusions is the Muller-Lyer illusion, named after the person who derived it in 1889.



In the Muller-Lyer illusion the central line of feather headed (B) looks longer than the arrow-headed (A) ,central line although both are in equal length. This false perception of the lines is the Muller-Lyer illusion. Gregory (1968) explained illusion as effect of misleading perspective cues. The argument is that the ingoing fins make the center line look like an outside corner, which is nearer to the viewer. The outgoing fins, on the other hand, make the line look like on insider corner, which is farther away from the viewer. Since the ingoing fins make the line appear to be nearer, there is a compensatory decrease in its apparent size. The reverse holds for the outgoing fins.

Like size illusions we have shape illusions as well. Coren and Girgus (1978) reported one real example of it. In 1965, two airplanes were about to arrive in New York city. Because of the Poggendorf illusion; where a line disappears at an angle behind the solid figure, reappearing at the other side - at what seems to an incorrect position; they perceived that they were on a collision course. Both pilots changed their paths to correct for what they perceived as an error, and the planes collided. The result was four deaths and forty nine injuries - all because of an illusion.

Some illusions are universal and some a personnel in nature. We find railway lines coming closer at some distance, the sky touching the ground or sea at a long distance. These are examples of universal illusion. Some body may have specialised types of illusions of her own. This is personal illusion. In all cases, the object is present but perceived incorrectly for one reason or the other. Illusions are not only related to visual field but with other senses as well. This may be touch or audition.

Perception of pain

Pain is a common experience in life. It has an adaptive role. Two types of pain seem to exist — quick and sharp; dull and throbbing. When you get a cut on any part of the body you get a quick and sharp pain and a sore muscle or an injured back give you a dull and throbbing pain. Many attempts have been made to

understand the nature and management of pain but no clear-cut findings are available. The reason is that like other sensory experience pain sensation has no specific stimulus. It may arise from many sources like a bright light, loud noise, high or low temperature etc. How do we experience pain? There are two theories which try to explain nature of pain. One is *specificity theory* and other is the *gate-control-theory*.

According to *specificity theory* there are specific pain receptors in the body which relay signals of pain directly to the brain. A person feels pain exactly where the stimulation occurs and the intensify of pain depends on the amount of stimulation at the pain site. Sensation of pain, this way, appears to originate in *free-nerve-endings*, located throughout the body is the skin, around muscles and in internal organs. This theory, however, does not explain for the phenomenon of *acupuncture*, in which insertion of needles into different places on the body surface relieves pain in body regions quite distant from the needle site.

The gate-control theory developed by Melzack (1973) for pain sensation is more satisfactory so far as explanation is concerned. This theory explains the phenomenon of acupuncture as well. The theory maintains that the transmission of pain signals depends on 'gate-control-mechanism'. Which permit or block the transmission of pain signals to the central nervous system. The stimulation is certain areas will open the gate to allow pain signals to pass and stimulation in some other areas will close the gate, so that pain signals from any part of the body cannot reach the pain reception areas of the brain. Both the processes are based on neural mechanisms in the spinal cord. Normally, pain messages carried by the large fibers cause this 'gate' to close and messages carried by smaller fibers — the ones related to dull, throbbing pains- do not. This explains as to how sharp pain is relatively brief and an ache persists. This theory explains the phenomenon of acupuncture satisfactorily.

It believes that the needles are inserted at the places that activate the reticular formation of the brain stem, one of the gate-control areas of the nervous system. As the outcome, pains signals coming from the site of the needles are blocked before they reach the brain, hence, pain is not perceived. You may have experienced that when you are anxious or in emotional states, the pain intensifies. Why is it so? This theory explains this aspect as well. It states that the current emotional state interact with the onset of painful stimulus. The brain may affect pain perception by transmitting messages that either close the 'gate' or keep it open. In anxious state it opens the 'gate' resulting in intense pain and in relaxed state it closes the 'gate with feeling of less intense pain. Keeping this fact in mind an innovative approach of treatment of pain has been developed based on neural stimulation devices. Culture, where pain tolerance is taught to increase through several cultural practices, plays an important role in pain perception. Many studies on tribes are available which indicate such an impact. Cognitive process also alters perception of pain. The extent to which we experience pain results from two dynamic interactions - characteristics related to the pain and the context in which pain emerges. Cognition or thought plays an important role in determination of intensity of pain. In cricket play, perception of pain is less intense as compared to the state where one gets a hit of a ball while walking in easy state. Our thoughts, feelings and beliefs dramatically manage our perception of pain. Weisenberg, Raz and Hener (1998) conducted a study in which subjects watched one of the three types of film or no film; a humorous film intended to

induce position mood; a holocaust film to induce a negative mood; or a neutral film that was not expected to affect the mood, one way or the other. Subjects were then exposed to a harmless but painful stimulus. As predicted, humorous movie viewers showed greater pain tolerance as compared to other groups. This shows that possessing a positive outlook can be an effective tool to counteract the effects of pain. Cognitive restructuring has shown better results in pain tolerance. This is why, in cancer patients mainly this technique is used to increase pain tolerance satisfactorily.

3.5 PHANTOM LIMB EXPLANATION

A special type of perception of pain is known as Phantom limb pain. In such a type of pain a person has illusion that a limb still exists following its amputation with sensation of pain. Researchers have been interested in studying the attributes and potential mechanisms involved in it. The presence of a phantom limb is seen as a natural consequence of amputation. Researches in the area distinguished between pain in the residual limb, phantom sensation and phantom limb pain. You may be interested to know about phantom limb pain — its nature, incidence and possible explanations. *The Phantom limb pain is defined as painful sensations referred to the absent limb*. (Jenson and Rasmussen, 1994). Substantial literature suggests that phantom limb pain is rare but some other studies indicate that about 60-80% of amputees experience phantom limb pain. Of these, 'severe' phantom limb pain occurs only in 0.5 to 5 % of all amputees. This pain is primarily localised to the distal part of the missing limb. In upper limb amputees, this pain is normally felt in the fingers, palm of the hand and occasionally the wrist. In lower limb amputees, it is normally experienced in the toes, ball of the foot, top of the foot and ankle. Such pain is commonly reported as 'burning' and 'cramping'. In some other cases, it is reported as 'numb', 'smarting', 'stinging', 'throbbing', 'piercing' and 'tearing'. Mostly phantom limb pain is inferred from the amputee's request for treatment and some are measured using different tests available for the purpose such as verbal descriptor scales (Dawson and Arnold, 1981). Such researches are based mostly on military samples, primarily young men who lost their limbs as a result of trauma and some on elderly amputees, who customarily have a primary diagnosis of peripheral vascular disease. The sample of such studies is very small so the impact could not be generalised. Very small sample of females is there in such studies, may be, about 5% to 7%.

The explanations are mainly available from two angles — physiological and psychological. The early theories on the etiology of phantom limb pain mainly are based on *specificity* or *pattern* theory of pain. Later physiological research was based on the framework provided by *Gate-Control theory* and focused on identifying peripheral, spinal and central neural mechanisms. Psychological theories, on the other hand, studied it in psychoanalytic or personality theories of chronic pain which mainly indicated that it is the outcome of pre-amputation psychological disturbance. The studies on phantom limb pain, on the whole, have both conceptual and methodological shortcomings. Therefore, a clear cut picture of the situation is yet to be discovered.

3.6 PHYSIOLOGICAL EXPLANATION

Early physiological theories of phantom limb pain explain it in 'specificity' angle and peripheral factors. Such researches proposed that stimulation of the nerve endings in the amputation stump transmits information to the brain that is interpreted as phantom limb pain. Some other researches have indicated the role of peripheral nerve fibers in such pain. Following amputation, fibers from the cut end of nerves grow nodules (neuromas) which generate abnormal impulses. These impulses activate central nervous system neurons and result in the perception of phantom pain. Many studies believe that such a pain can not be explained by peripheral mechanisms alone. This provided alternative mechanisms which stated that such a pain can be attributed to abnormal firing patterns in the internuncial neurons in the spinal cord (Livingston, 1943). A sample of 36 upper limb amputees suffering from phantom limb pain were injected a local anesthetic into the sympathetic ganglia in the spinal cord. Nine of these reported a permanent reduction in the pain and more than two-thirds reported a temporary reduction. Some researches believes that peripheral and spinal factors are alone account for phantom limb pain. It has been finally concluded that although disinhibited spinal cord neurons may be responsible for phantom sensation, it is unlikely that this is the primary cause of phantom limb pain.

3.7 PSYCHOLOGICAL EXPLANATION

Some researches believe that this type of pain can be explained by looking at the psychological make-up of the amputee. Psychological theories have attributed chronic pain to personality disorders, marked depression, guilt, childhood deprivation, or trauma, defense against loss or repressed hostility and aggression.

Parkes (1973), in a study, reported that those who have persistent phantom pain scored highly on a personality measures of 'compulsive self reliance' and 'rigidity'. Rigid personality dislike and resist change and hence experience persistent phantom limb pain as they find it difficult to deal with the changes that are an inevitable consequence of amputation.

Emotional disturbance has been considered significant in its etiology. Some studies suggested that psychological explanations have less to do with such a type of pain relating personality and more to do with the post amputation experience of many amputees suffering from phantom limb (e.g. Sherman et al; 1987).

Another group of studies state that such a type of pain results from the use of defense mechanisms such as 'denial' or 'repression'. Some studies noted that a psychological distress that occurs following loss of a limb is similar to that noted following loss of a spouse. Many such cases were suffering from depression.

On the whole, it may be concluded that both the physiological and psychological explanations do not account for phantom limb pain fully. This is because of multi casual nature of such pain, proposed by Gate Control Theory, which you have known earlier.

The neuro-matrix theory which is defined as 'network of neurons that extends throughout widespread areas of the brain, composing the anatomical substrate

of the physical self' provides a better answer to this phenomenon with diversity. This theory, in many respects, is similar to Gate Control Theory. The difference is in the postulation of neural network across widespread areas of the brain, in which activity of one area will result in output from the entire network. To sum up, it can be stated that much more research is required to understand this phenomenon in comprehensive manner.

3.8 LET US SUM UP

In this chapter you have come to know the visual system, wavelengths, amplitude, structure of the eye, colour vision phenomenon and theories, illusions, perception of pain and its phantom limb explanation. These are all very interesting as you are now able to understand the important factors which determine our proper adjustment in life. These are all factual in nature and easy to grasp, if studied carefully.

3.9 UNIT END QUESTIONS

1) How wave length determines colour vision?
2) Where retina is situated
   a) ear
   b) skin
   c) eye
   d) nervous system
3) What is young Helmholtz theory?
4) Which gives sensation of colours
   a) rods
   b) cones
   c) cochlea
   d) amplitude
5) Sensation + meaning is %
   a) Illusion
   b) Perception
   c) Signal detection
   d) Hallucination
6) Colour blind has absence of:
   a) Rods
   b) Cones
   c) Proper wavelength
   d) Fovea
7) What is illusion?

8) Pain is perceived through
   a) Only eyes
   b) Only ears
   c) Only skins
   d) Through all senses
9) What is phantomlimb pain?

3.10 SUGGESTED READINGS

Coren, S. and Girgus, J.S. (1978) *Seeing and Deceiving : The Psychology of Visual Illusion*. NJ: Lawrence Erlbaum.

Coren, S. Ward, I.M., & Enns, J.T. (1999) *Sensation and Perception* (5th ed.) Fort Worth, TX: Harcourt Brace College.

Haber, R.N. and Fried A.H(1975). *An Introduction to Psychology*. New York: Holt, Rinehart and Winston

References

Dawson, L., and Arnold, P. (1981) Persistent Phantom limb pain. *Perceptual and Motor Skills*, 53, 135-138.

DeValois, R.L. (1965) Behavioural and Psycho-physiological studies on primate vision. In Neff, W.D. ed., *Contributions of Sensory Physiology*, Vol.1, New York: Academic Press.

Graham, C. H. and Hsia, Y. (1958), Colour diffect and Colour theory, *Science*, 127, 675-682.

Gregory, R.L. 9168) Visual illusions. *Scientific American,219*,66-76

Hubel, D.H., and Wiesel, T.N. (1979), Brain Mechanisms of Vision, *Scientific American*, 241, 150-162

Jensenn, T.S., and Rasmussen, P. (1994) Phanton Pain and other phenomena after amputation. In Wall. P.D. Melzack, R. (ed.) Textbook of pain, 3, London: Churchill Livingstone; 651-683.

Kaufman, L., and Rock, I. (1962) The Moon Illusion, *Science*, 136, 953-61.

Livingston, W.K. (1943) Pain mechanisms (a physiologic interpretation of causalgia and its related status). New York: Mcmillan.

Matlin, M.W., and Foley, I. (1997) *Sensation and Perception*. Needham Heights, M.A.; Allyn and Bacon.

Melzack,R. (1973). How Acupuncture Works. *Psychology Today*. June

Nathans, J., Thomas, D. & Hogness, D.S. (1986). Molecular Genetics of Human Colour Vision: The Genes encoding Blue, Green and Red Pigments. *Science*, 232, 193-202.

Parkes C.M.(1973) Factors determining the persistence of phantom pain in the amputee. *Journal of Psuchosomatic Researches. 17*: 97-108.

Rosenfeld, I. (1999). Is laser eye surgery for you? *Parade*, p.4-6

Sherman, R.A., Sherman, C.J., Bruno, G.M. (1987) Psychological factors influencing Phanton Limb pain (an analysis of the literature), *Pain,* 28, 285-295.

Weisenberg, M., Raz, T.A. & Hener, T. (1998) The influence of film induced mood on pain perception, *Pain,* 76, 365-375.

Zeki, S. (1992), The Visual image in mind and brain. *Scientific American* (Sep), 69-76.

UNIT 4 LEARNING AND MEMORY: DEFINITION; CHARACTERISTIC FEATURES; OBSERVATIONAL, EXPERIMENTAL LEARNING; SENSORY, SHORT TERM AND LONG TERM MEMORY; INFORMATION PROCESSING MODEL

Structure

4.0 INTRODUCTION

You have acquired many good things in your life-time, such as, you know how to read, write and perform other functions in socially desirable manner. You have acquired these through experience in your life time. Such an experience has remained interactive. These skills help you in adjusting in life in appropriate manner, you behave in descent manner with others in social situations and in personal life. How have you acquired such behaviour patterns? This is through the process of learning. Learning process is crucial to all organisms which eventually results in proper adaptation in different situations. This way, living becomes comfortable. Similarly, you remember many things, incidences etc. which help you to manage your daily routine and future planning. If you start

forgetting things which you have encountered during your day-to-day interaction, you may face difficulty in discharging your important duties assigned to you in personal and social situations. You remember things as you have a special power called 'memory'. Memory helps you in proper adjustment in life. You will be able to know in this chapter the meanings of learning and memory, the two very important aspects of life. You will also know the learning processes and their characteristics. Similarly, you will also understand as to how memory works in retaining our experiences. A few things you retain for a short time and others for a long time in your memory. How this retention process takes place? Forgetting is opposite to memory. Description of memory functions will give you definite idea about process of forgetting as well. This chapter, this way, will deal with very important aspects of human existence. You will find it interesting as this will help you in understanding yourself and others in the manner a common man does not know. The theories and other related facts will be presented in simple and clear-cut manner so as to help you the pick-up and retention more easily.

4.1 OBJECTIVES

After reading this unit, you will be able to:

- Define learning and memory;
- Identify the characteristics of learning and memory;
- Describe the concept and process of the observational and experimental learning;
- Identify the salient features of the sensory, short term and long term memory; and
- Describe the information processing model.

4.2 LEARNING: DEFINITIONS AND CHARACTERISTICS

We develop different skills and adapt to changing conditions of the world around us. Our experience help in shaping our behaviour suitable to the needs. This experience we get through the process of learning. Since birth many new features are added to our behaviour which more or less form the part of our life. This is almost permanent in nature. The *learning* is defined as 'any relatively permanent change in behaviour, or behavioural potential, produced by experience." This definition has the following characteristics:

i) learning does not apply to temporary change in bahaviour

ii) the behavioural changes due to maturation process does not form part of learning.

iii) learning can result from *vicarious* as well as from direct experience

iv) learnings are not always positive in nature. We learn bad habits as well in the process

Learning is the key factor in behavioural change of an organism. Through learning we make changes in our behaviour. These are many processes through which we get experience in life. Psychologists have found out such processes.

All modifications of behaviours are not learned. Some modifications do take place due to physical maturity. In most of the cases the distinction between learning and maturation is very clear but in some places this distinction is less obvious. You take an example of infant's walking. Normally, infant does not walk before the age about 12-15 months. They walk when they are physically fit and ready, perhaps, without learning. So walking here does not have the role of learning. But in children recognition of colour is the outcome of learning. This way, the impacts of learning and maturation on modification of behaviour are different.

Learning plays an important role virtually in every activity we perform. Psychologists believe that learning takes place in several basic forms. These basic process are observations learning, classical conditioning and operant conditioning. *Observational learning* is a form of learning where organisms learn by observing behaviours and the consequences of behaviour of others around them. *Classical conditioning* is a form of learning in which two stimulus events get associated in such a way that the occurrence of one event reliably predicts the occurrence of the other. Classical conditioning is a form of learning in which organisms learn association between behaviours and stimuli that precede them (antecedents) or follow them (consequences) you will come to know about these basic procedures of learning in paragraphs to follow. The classical conditioning and the operant conditioning will form the portions of experimental learning as these two forms have the characteristics of experimentation.

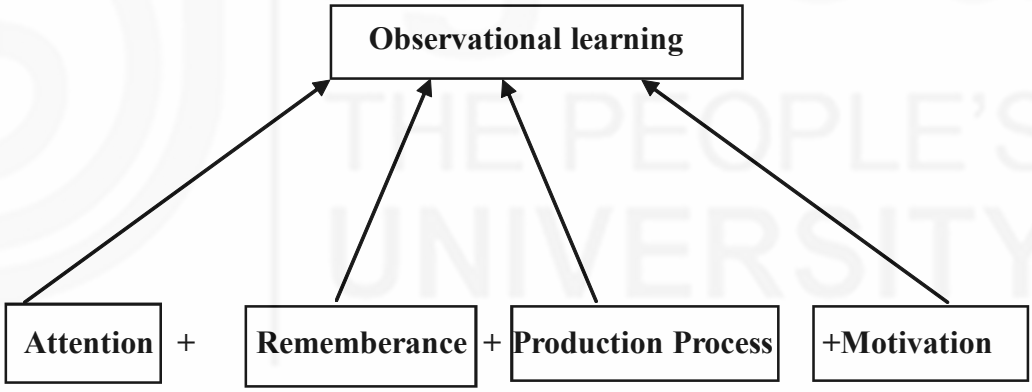
4.2.1 Observational Learning

While watching television you must have witnessed many aggressive scenes. Many detective stories present as to how the murders and thefts are committed in a planned manner. Many serials of social importance you may have seen as well as television. There is a discussion that such serials or shows need not be shown on televisions as children get influenced by it and start behaving in the same manner. Many criminals, caught by police, confessed that they committed crime by viewing a particular movie or a serial of the same type. Many researches are available in the literature which reveal that young people learn aggression through watching the actions of others.

Bandura et al; (1963) reported one study known as 'Bobo doll' study. One group of nursery-school children saw an adult engaged in aggressive actions against a large inflated Bobo doll. The adult who was serving as model knocked the doll down, sat on it, insulted it verbally, repeatedly punched it in nose. Another group of children were exposed to another model who behaved in a quiet, non-aggressive manner. Afterwards, both the groups of children were put in a room where several toys including a Bodo doll were available. The behaviours of children were observed carefully and found that those children, who had seen aggressive model, started behaving in the same way. They punched the toy, sat on it and uttered verbal abuse similar to those of the model. The control group children did not show any kind of aggression and played peacefully. The results of this observation clearly indicate that children do shape their behaviour by observing others in social situations around us.

No doubt, observational learning exists where one adheres to the bahviours of a model, the liked person. You may now be interested to know as how and to what extent we acquire behaviours, information or concepts from others. Bandura

(1986) described the four conditions which facilitate behaviour change through observation. The four conditions are — *attention, retention, production process* and *motivation*. For learning through observation one must pay attention to the persons performing activities which one likes, people attractive to them, the behaviours which are desirable in the eyes of the observer, suiting the needs and goals of the person observing the behaviours. In other words, the extent to which one focuses on others' behaviour is attention. Another factor is remembrances i.e. the extent to which one remembers what the other person has done or what did he say? More the remembrance, more quick is the adaption of actions. Suppose, you try to copy the tune of a song. It will be easily ready if you correctly remember the musical details of the song. The third factor is production processes. You may remember the song and its musical details but if you can not perform due to voice disability or lack of knowledge of musical principles, you can not make a change in your behavioural pattern. Hence, observational learning does not take place. Production process, hence, depends on two main bases — the physical ability of the person getting learning and the capacity to monitor the desired behaviour till perfection is achieved. The fourth factor, motivation, is extremely powerful in behavioural learning. If the action, information received by a model is not useful for the observer, then it will not be used and easily forgotten. Motivation keeps the observer in the state of readiness to accept the things they need. Only such behaviours are borrowed from others in the world about which the observers feel it is a must for them. This motivation level results in increased efforts to achieve success by observing others in the society. In most of the cases, some people become role models due to this process:



Basic determinants

Both positive and negative behaviours are adapted through observational learning. People easily get influenced by other people around them. The social, moral and other values are mostly absorbed by behavioural learning model. This is why, the parents see that their children always play with good children, see only socially desirable behaviours. You may remember in joint families old ladies mostly used to tell religious, moral, social stories so that in open environment children should try to follow the same pattern and be good children. Suppose, you visit some friend's house. You get a cup of tea. When the tea is over, you keep your cup yourself on the table. Children are keen observers. If some child observes your behaviour, on her visit to any other house, if sweet is given to her, she will try to keep the empty plate on the table herself. This way, observational learning takes place. Aggression, or normal bahaviour, in higher degree is supposed to be a negative behaviour. Many studies have shown that when aggressive behaviour

gets re-enforcement by observation in movie or television, it is accepted by children or even adults. Aggressive is added to their repertoire. Later when angry or frustrated they use such aggressive behaviours towards others.

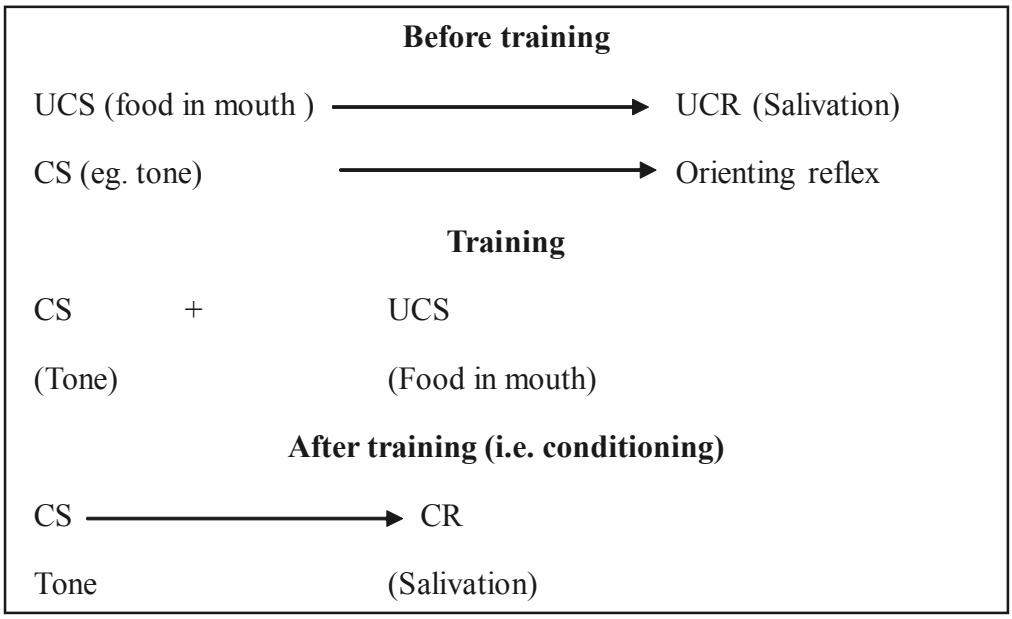
Observational learning is a complex process - more complex than mere imitation. A child develops in a society which may have a different cultural-social values than a place where, in adulthood, gets a job. To adjust in a new situation is comparatively difficult and sometimes gets a 'culture shock'. Such a person may be given cross-cultural training through experimental approach based on behavioural modeling. Here, trainees first watch films in which models exhibit the correct behaviours in a problem situation. They, then, take part in role-play exercises to test their knowledge. Finally, they receive constructive criticism regarding performance in role-play. Studies have found it very effective in altering behaviours in the desirable direction (e.g. Harrison, 1992). The concept of social learning is fully based on observational learning in which one observes determined by cognitive processes. While deciding the model, one considers the outcome from different angles. If cognitively one is satisfied then particular behaviour of the model is accepted. Such accepted behaviour stays in the person for a long period. Observational learning, in a way, shapes our lives effectively.

4.2.2 Experimental Learning

Under this heading you will come to know about two-classical and instrumental conditioning. These two kinds of learning exist is a matter of fact, not of theory. You will also know if all kinds of learning can be understood in these terms. These two concepts of learning gave the explanation of learning procedures an experimental shape.

4..2.2.1 Classical Conditioning

Whenever there is a lunch time you feel hungry, if you have a set-sleep time you feel a sleeping mood. How is it felt? These activities do take place when a particular time is fixed and if the time-table for such purposes is flexible and irregular, then feelings may not be strong enough. This type of behaviour or similar one has been explained by the classical conditioning. Ivan Petrovich Pavlov (1849-1936), while conducting experiments on dogs about various digestive reflexes, found out that salivary reflex could be set off by stimuli which at first were totally neutral. The experiment he conducted was simple but controlled. The dog was put in a laboratory with a system where the saliva discharged can he measured by the dog each time. When hungry, saliva comes out in mouth if food is present. He paired a buzzer sound to food i.e. a buzzer sound was produced before the food was provided to the dog. After a few trials it was seen that when buzzer was produced without food the salivation took place in the dog. Repeated buzzer-food pairings led to salivation to the buzzer alone. This process was known as classical conditioning. In most of the reflexes this process explains the learning procedures. The whole experiment can be explained in the following manner:



Relationship betweens CS, UCS, CR and UCR in classical conditioning

The first step in the experiment was to attract attention to a neutral stimulus such as buzzer. The dog had a reaction 'what-is-it?' type, what Pavlov called *orienting reflex*. The dog paid attention to it by turning head towards the stimulus i.e. buzzer. The next step was the repeated buzzer food pairing leading to salivation to the buzzer alone. In each trial the buzzer was produced and then food. After a few trials only buzzer was produced and no food. Yet salivation took place only with buzzer tone. Pavlov explained the whole process by making a distinction between unconditioned and conditioned reflexes. Unconditioned reflexes, he held, to be essentially inborn which can be elicited unconditionally by the appropriate stimulus, like salivating to food in the mouth. Conditioned reflexes were acquired based on organism's past experience. In this case, salivating to buzzer. *Unconditioned reflex* is based upon a connection between unconditioned stimulus (UCS) and unconditioned response (UCR), in this case, food-in-the-mouth (UCS) and salivation (U.C.R.). *Conditioned reflex*, on the other hand, are condition stimulus (CS) and conditioned response(CR), in this case, buzzer(CS) and salivation (CR.) The CS is initially a neutral stimulus (the buzzer) that is paired with UCS; the CR (salivation) is the response elicited by the CS after some pairings of CS and UCS. The pairing is said to *reinforce* the connection; trials on which UCS occurs and on which it is omitted are called *reinforced* and *unreinforced* trials respectively.

Classical conditioning in human's daily life is very common. You tend to feel hungry at meal-times and less so during the periods in between, this is so even if you fast the whole day. It has a role in formation of various emotional reactions and fear is the best examples. Fear is developed in children through conditioning. Phobia, the intense fear, is the outcome of conditioning. Normally, all basic needs of human are conditioned in nature.

4.2.2.2 Higher-order-Conditioning

On many occasions when the CS-UCS relation is solidly established, the CS can serve to condition yet another stimuli. Pavlov, for example, on one occasion conditioned a dog to salivate to the beat of metronome, using meat powder as the UCS. After many such trials, he presented the dog with a black square followed by the metronome beat but without ever introducing food. Sight of the black

square, after a few pairings, was enough to produce salivation. This process is called *higher-order-conditioning.* The higher order conditioning is comparatively very weak and stays for a short period. The reason is clear – it does not stay for a long as it gets a weak relationship as compared to original one.

4.2.2.3 Temporal Relations between CS and UCS

The order of presentation of the CS and UCS plays a significant role in conditioning process. In the pairing of CS and UCS, CS may precede UCS (forward pairing), it may follow UCS (backward pairing) or it may occur at the same time (simultaneous pairing). The different procedures of presentation have differential effect on conditioning. Conditioning is the best when CS preceded UCS by about half a second; presenting CS and UCS simultaneous is least effective and backward pairing procedure is just as bad as worse (Spooner and Kellogg, 1947). Pavlov further stated that conditioned reactions (CR) can be undone if the CS is repeatedly presented without being reinforced by the UCS. In such a condition, conditioned reflex undergoes *experimental extinction*. Similarly, a conditioned response that has been extincted can be resurrected. It is through *reconditioning*, where further reinforced trials are presented. Conditioning is also *generalised* on stimuli sufficiently similar in nature or activity. *Discrimination* is also available in conditioned responses. This classical conditioning, you have discussed over here is one of the two main forms of simple learning.

4.2.2.4 Instrumental Conditioning

Instrumental conditioning is also known as operant conditioning. It is a form of learning in which a reinforcer (e.g. food) is given only if the animal performs the instrumental response (e.g. pressing a lever). In effect, what has to be learned is the relationship between the response and the re-inforcer. Edward L. Thorndike (1874-1949) conducted controlled experiments in which the entire course of learning could be carefully securitized. On the basis of the experiments *law of effect* was advanced. The law of effect asserts that the tendency of a stimulus to evoke a response is strengthened if the response is followed by reward and is weakened if the response is not followed by reward. This theory, applied to instrumental learning, states that as trials proceed, incorrect S-R bond will weaken while the correct bond will be strengthened.

The theory was derived from a simple experiment. The cat was put in a *puzzle box*, an enclosure from which it could escape only by performing some simple action that would open the door, such as pulling a loop or wire or pressing a lever. When the cat came out, it was given a small portion of food and then placed back in the box form further trials. This continued till the mastery in opening the door was achieved. How the cat learned to open the door of the puzzle-box? Thorndike noted actions of the cat and found out that it was based on trial and error basis. The curve drawn of the responses made it more clear that it was not based on any insight. Had it been on insight, the next trial after the solution would have been more straight- forward taking very little time in opening the door. This was not so.

Thorndike explained it on the S-R bond basis that the animal learned was an association between the total stimulus and a motor reaction. In the beginning of the experiment there were many unrewarded responses which gradually weakened and 'stamped out' and correct responses were 'stamped in'. This is S-R theory

and basic components of learning are stimuli and responses which become forged together as training proceeds. This theory is based on the law of effect. The law of effect is an analogue of the law of the survival of the fittest. In the life of humans learning provides another adaptive mechanism through the law of effect which decrees that only the *fittest responses* shall survive. Thorndike (1899) put it "it is a process of selection among reactions… by eliminating the unsuitable reaction directly by discomfort, and also by positively selecting the suitable one by pleasure… It is of tremendous usefulness… He also learns and runs away, will live to learn another day."

Thorndike talks of two types of reinforcement – primary reinforcement and secondary reinforcement. Reinforcement used in animal studies are normally food, water or termination of the electric shocks. There are instances of primary reinforcements. You see a child behaving in desirable manner. You do not normally reinforce the behaviour through primary reinforcements but say 'good' to her. How this 'good' is reinforcing according to Thorndike's view? The answer is that a stimulus can acquire reinforcing properties if it is repeatedly paired with a primary reinforcer. It will then provide *secondary reinforcement* if administered after a response has been made. It has been proved by several other studies by other investigations as well.

4.2.2.5 The Operant Approach

The modified behaviour theory was developed by B.F. Skinner. Skinner underlines the distinction between classical and instrumental conditioning. Animal's behaviour is elicited by CS is classical conditioning; the salivation appears to be set off from the outside, thus justifying the reflex analogy to some extent. But in instrumental conditioning, the organism appears to be less at the mercy of external stimulation. It's reactions are *voluntary*, as it seems to come from within. Skinner defined such instrumental responses "operant;" they *operate* on the environment to bring about some change that leads to reward (Skinner, 1938). He conducted experiments in a properly controlled and monitored box named after him "Skinner Box". Animals in the box got reinforced if they peck or press and in return got some food grain. In operant conditioning a given behaviour will occur on the consequences that follow it. Some consequences will be positive that strengthen the behaviour where as some negative which suppresses the behaviour.

Strengthening the behaviour is called *reinforcement* and suppressing the behaviour is called *punishment*. The operant conditioning is a process through which organisms learn to repeat behaviours that yield positive outcomes or permit them to avoid or escape from negative outcomes. Positive reinforcement increases the probability that the action will occur again in the future. Some positive reinforcers are related to basic biological needs and called primary reinforcers. We need food when hungry, need water when thirsty. Some other events acquire their capacity to act as *positive reinforces* through association with primary reinforces and called conditioned reinforces viz., money, status, grades, trophies and praise from others. Negative reinforcers are those that strengthen responses that permit an organism to avoid or escape from their presence. Such negative reinforces may be heat, extreme cold, electric shock. Positive reinforces are stimulus events that strengthen the responses that precede them, where as negative reinforcers are aversive (unpleasant) stimulus events that strengthen responses that lead to their termination or at least avoidance. The operant conditioning is based on these principles.

If you summarize the difference between the two important methods of conditioning by a rough description of what is learned in each; you will find a difference. In classical conditioning the organism must learn about the relations between two stimuli, the CS and the UCS: Given CS and UCS will follow. In instrumental learning, the organism has to learn the relation between a response and a reward: Given this response, there will be reinforcement. These two theories have accounted for all types of learning in our life. On the basis of these theories many therapeutic procedures have been developed where undesirable behaviours are eliminated and new desirable behaviours are developed in humans.

4.3 SENSORY, SHORT TERM AND LONG TERM MEMORY: INFORMATION PROCESSING MODEL

4.3.1 Definition of Memory

Memory is defined as a cognitive system for storing and retrieving information. The memory has three main stages – *acquisition, retention* and *retrieval*. To remember, one must first have learned something and the relevant experience left some enduring record in the nervous system, the *memory trace*. During retention the information is filed away for later use. Retrieval is a point at which one tries to remember. Many failures to remember are failures of retrieval and not of storage. A previously retained item can be retrieved in two ways – *recall* and *recognition*. In recall, the person has to remember and produce the learned material verbally while in recognition, one has to recognise the learned material from amongst many other present over there. Recognition, therefore, is easier than recall. When some crime is committed, police asks the person to tell the features of the criminals who has seem them. On the basis of the recall, a portrait is prepared and circulated is public. Sometimes, the person, who witnessed the crime, is called by Police to recognise them in a group of persons. This is recognition. You may find easy to answer multiple-choice, or true-false item tests in the examination as it is a case of recognition. Essay type examination needs recall, therefore, a little difficult.

You usually think of the memory in terms of the past, may be an hour, a day, a month, a year or long. But memory comes into play the moment the stimulus registers on the senses. Someone tells you a mobile number and you remember it till you complete the dialing. The interval between acquisition and retrieval is of a second or two. In fact, several memory systems come into play in human life. This may be the sensory register, short term memory and long term memory. You will come to know about these types of memory in the following discussions.

The sensory registers:

Sensory registers is the first link between an individual's present and the past. This sensory information remains for a fraction of a second or so. Sperling (1960) conducted a study on sensory register in vision. An array of nine letters arranged in three rows of three letters were presented to subjects for 50 milliseconds.

S F O
M T B
F Z N

The subjects were asked to recall the letters. They reported about half of them. But Sperling believed that they saw many more letters than they were able to report. The subjects had a vivid mental picture or *icon* of the array after the stimulus went off. The icon fades away very rapidly. In fact, the visual sensory carries a good deal of information but only for a fraction of a second. This visual information appears like a printed page which turns blank within a second or so. Such a registration occurs in audition as well known as *echo*.

4.3.2 Short Term Memory (STM)

In your normal life you require much more than sensory register gives you in case of memory. Some memory holds information for fairly short intervals – say up to a minute and this is known as *short term memory. The duplex theory* of memory describes two types of memory – *short term memory* and *long term memory*. This theory explains that these two types of memories – one relatively recent and the other remote past – differ in *three* ways. One is the *manner* in which memories are consciously experienced, second is the *form* in which they are stored and third relates to *storage* capacity. Short term memory is perceived and not remembered as gone and done with. Items in short term memory (STM) are not *fully processed* as in long term memory (LTM) but not as *raw* and *unprocessed* as the contents of *sensory register*. STM for verbal materials tends to be in acoustic form even if the material is presented visually. If a subject is shown a series of letters, the immediate recall shows acoustic rather than visual confusions. Letters of similar sounds produce more confusion in recall than the letters of similar writing structures. The STM and the LTM differ also in storage capacity. STM storage capacity is very limited and LTM storage capacity is enormous. According to one estimate the size of an average college student's reading vocabulary is about 50,000 words. The storage capacity of the STM is determined by the *memory span*, the number of items (either letters of words) one can recall just after one presentation visually or orally. Miller (1956) found that a subject can recall 7 items, give or take about 2. This is known as *magic number.* This indicates the capacity limit of STM. Information entering STM are forgotten quickly. One reason may be the *decay*, the memory trace may be eroded over time. Another reason may be *interference*, new items somehow may be pushed out of STM.

When you ask subjects to recall a particular list of words shown to them can you tell from which storage system – LTM or STM - the item was taken? It has been shown that when *free recall* takes place the subjects describes enhanced recall of items presented in the beginning and of the end of the list. These are known as *primary* and *recency* effects. Primary effect is related to LTM and recency effect is related to STM as they could see the last few items in the immediate past. How retrieval from STM takes place? In another words, suppose an item is still is short term memory, neither forgotten nor transferred to the LTM. How do we retrieve it? The answer is simple. The retrieval from STM is not instantaneous, but requires some mental search and comparison. This may be done by *parallel search*, in which search is made and compared to each items in the memory set; or through *serial search*, in which comparisons occur successively.

4.3.3 Long Term Memory (LTM)

You have seen that sensory register and STM provide a bridge to our very recent past. It is long term memory (LTM) through which you perform many activities

in life and adapt with different situations. It is LTM to which you refer when you speak, read, recognise faces, play football and suddenly remember where you put key of the room that you could not find before. What governs the *acquisition, storage* and *retrieval* of long term memory (LTM) you will come to know in the following details. Most of the experiments related to memory are based on memorisation of verbal materials.

Two main view points are available in relation to LTM – association and organisation. The birth of an association was first studied experimentally in 1885 by Hermann Ebbinghaus (1850-1909). Ebbinghaus developed not only experimental techniques to investigate how associations in memory are established and utilized but also developed standard material of learning i.e. *Nonsense syllables*. He put two consonants with a vowel in between which do not constitute a word and meaningless. He also developed methods of learning viz., simple, serial, paired- associates and prompting and anticipation. On the basis of his experiments he plotted a curve which showed the nature of forgetting – known as *forgetting curve.* Retention is measured in percentage saving, that is, the present decrease in the number of trials required to relearn the list after an interval of no practice. If the percentage of saving is 100 per cent, retention is perfect – no trials to relearn are necessary. If the percentage saving is 0 per cent, there is no retention at all, for it takes just as many trials to relearn the list as it took to learn initially. Curve shows that retention declines (forgetting takes place) as the interval between original learning and retention test increases. Ebbinghaus stated that when we learn we have some memory traces formed. When memory traces become weak or blurred, forgetting takes place. This way, he stated that memory is a reproductive process. If memory trace is fresh, the recall is better and vice-versa.

Modern investigators in the field of human memory gave credit to the experimental base of the study of memory by the S-R associationists but simultaneously advocated that this approach can not provide a foundation for a general theory of human memory. They advocated the concept of *memory organisation*, a different approach to long term memory. These investigators believe that organised materials are better learned and remembered than the unorganised ones. Take one simple example: suppose a subject is asked to memorise the series:

2 4 7 1 1 1 6 2 2 2 9 3 7 4 6 .5 6

If one treats it as a series of seventeen digits unrelated, much effort is needed to remember perfectly. But if a pattern is found out it will be easy to remember. For example: add the first digit to 2, the next is 4 and add 3 to 4 next is 7. This way keep on adding gradually, 4, 5, 6, 7, 8,9,10 then it will come out to be

2 4 7 11 16 22 29 37 46 56

Organisation affects both acquision and retrieval and such examples are representative of human memory functions generally. To enter LTM, items must first pass through STM. Materials in LTM are stored greater in number as it is organised. In the example given before the person organises the material through *recorded inputs* into larger units, sometimes called *chunks*, which help in putting much information into memory. *Subjective organisations* and *rehearsal* have powerful effect on recall. In subjective organisation one memorises a virtually

endless list of items by appropriate hierarchical schemes of one's own. Rehearsals are of two types where organisation takes place – *maintenance rehearsal* and *active rehearsal*. In maintenance rehearsal, the subject merely holds materials in short term memory for a while and then transfer to the LTM. In active rehearsal, the subject organises the item during the item during the time they are in short term memory store and then transfer to the LTM.

Material organisation may help in explaining another phenomena of verbal learning: *Intentional* and *Incidental Learning*. You do one experiment with two of your friends comparable in abilities. Prepare a list of 25 words and serially put on a piece of paper. Show the list to one friend for five trials – showing words one by one for about 10 seconds each. When the trials are over take a recall. Again present the list to another friend in the same manner with the instruction that he will be tested in the end of the experiment on recall. Get the recall in the end of the experiment. You will find that the second friend has recalled more words as compared to the first one. Why so? The reason is that one who was given information about the recall test, rehearsed the items and the other one did not. The learning where not informed of the recall test was *incidental one*; and where recall test was informed earlier, the *intentional one*. This is one example of the role of rehearsal is organisation in memory.

Retrieval cues play an important role in memory. Sometimes it is seen that memory is stored but not easily traceable. In such a case memory trace is said to be presently *inaccessible.* Access to the trace may be done by an appropriate *retrieval cue*. For this purpose, the critical requirement is an adequate match between the retrieval cue and the way the material was organised at the time it was stored. It is done by *memory search* where retrieval is generally preceded by an internal process. *Mnemonics*, a device for improving one's memory, is based on some of the principles of storage and retrieval. The methods of *loci* and *pegs* are most common. The method of *loci* requires the learner to visualise each of the items she wants to remember in a different spatial location. In recall, each location is mentally inspected and the item is retrieved. The *peg method* requires creation of a set of mental pegs to which the items to be memorised could be attached. It helps in retrievation. The underlying principles in method of loci and pegs are obviously similar.

4.3.4 Forgetting from LTM

Forgetting means failure of memory. It has different causes. One theory of forgetting believes that memory traces gradually *decay* as time passes. Memory trace is compared, as per this theory, to a negative of a photo-film. So long it is intact, the print will come out clearer, otherwise it will not be clear. This is true to memory. As time passes, it does not remain vivid, hence, recall is poor and forgetting takes place.

Another theory relates to *interference*. According to this view, a forgotten memory is neither lost or damaged, but is only misplaced among a number of other memories which interfere with the recovery of the one that was sought. Memorial interference can be easily demonstrated in laboratory. The major examples of interference are *retro-active inhibition* and *pro-active inhibition.* When a new learning hampers recall of the old, it is known as 'retro-active inhibition' and when earlier learning hampers recall of the new one, it is known as 'pro-active

inhibition'. In earlier case interference is in backward direction and in the next case it is in forward direction.

The experiments of the both types may be conducted in the following way:

Retro-active inhibition

Groups	Original learning	Interpolated activity	Recall
Control	Learning of list A of 10 Nonsense syllables	Rest for 5 minutes	List A
Experimental	Learning of List B of 10 Nonsense syllables	Learning of list C of 10 Nonsense syllables for 5 minutes	List B

Pro-active inhibition

Groups	Original learning	Interpolated activity	Recall
Control	Learning of list A of 10 Nonsense syllables	Rest for 5 minutes	List A
Experimental	Learning of List B of 10 Nonsense syllables	Learning of list C of 10 Nonsense syllables	List C

4.3.5 Varieties of LTM

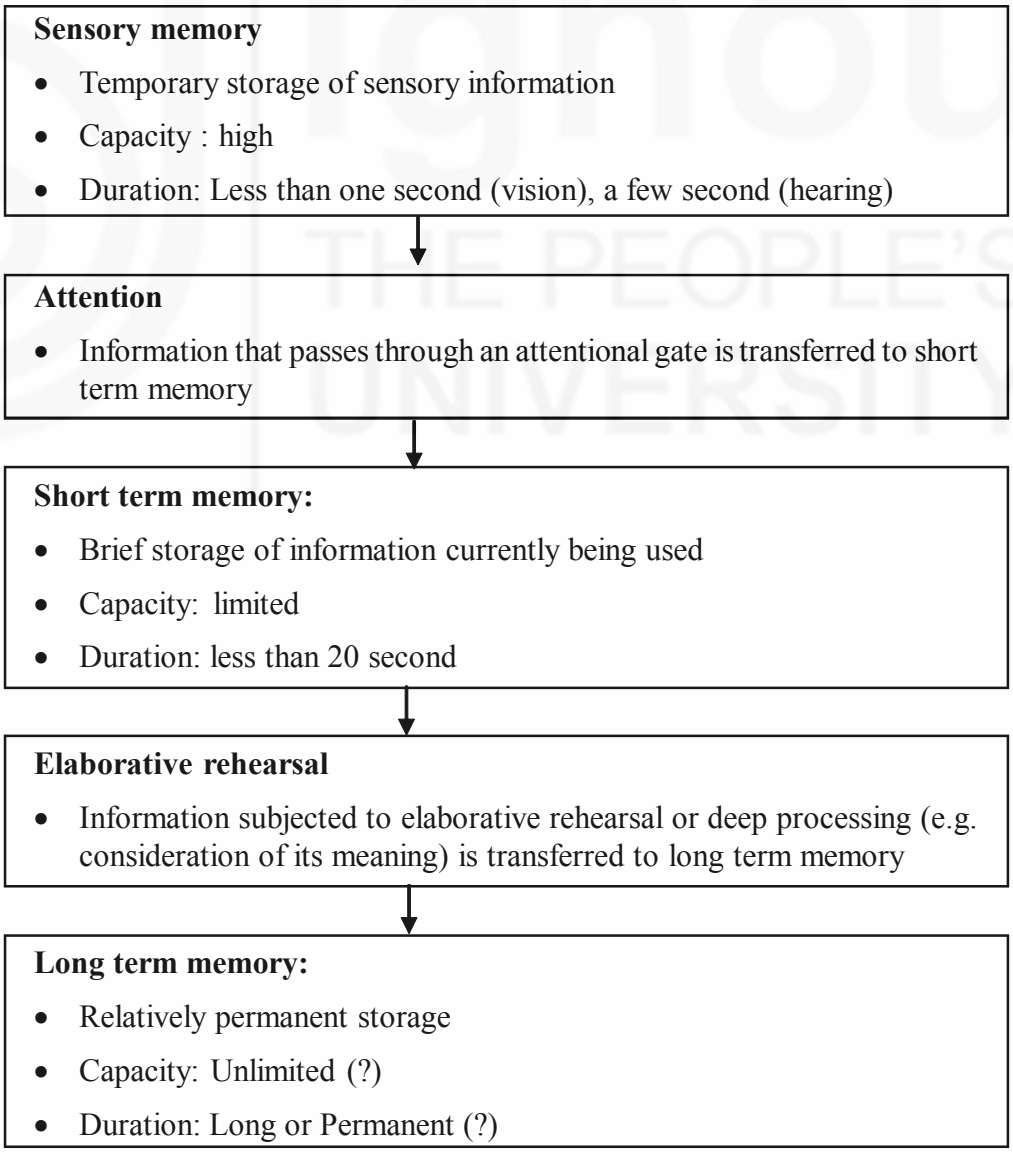
There are many varieties of long term memory. Some of them are *Episodic memory, Generic memory, Semantic memory* and *Visual memory*. Episodic memory is the memory for particular events (episodes) of one's own life; what happened when and where. Generic memory is memory for items of knowledge, independent of particular occasion in which you learned them, such as capital of India, multiplication of 3×4 and so on. Semantic memory is related to meanings of words and concepts. Visual memory may be of two types – iconic memory and eidetic imagery. Iconic memory is one which you have encountered before. It is certainly picture like, but obviously not a part of long term memory as it lasts only for fraction of a second. Eidetic imagery on the other hand, is relatively long lasting and detailed images are very clear.

4.3.6 Information Processing Model

Many psychologists believe that human memory and computers have the same information processing systems. You have seen as to how items are first temporarily stored in STM, recoded into fewer and more compact chunks, transferred into LTM and then retrieved by various hierarchical search processes. You have seen a system in which information is systematically converted from one state into others in memory. Psychologists have described several models of human memory. Models seek to achieve two major goals – accurate description and explanation i.e. clarification of how the processes being studied operate. Models are developed on large number of empirical observations. You will come to know about one such very popular model of memory known as "Modal Model of memory" advanced by Alkinson and Shiffrin (1968). The researchers noted that both human and computer memory must accomplish three basic tastes – encoding, storage and retrieval. The meaning of these tasks you have already known in the previous details presented in this chapter. Keeping these facts in mind Alkinson and Shiffrin went on to propose a model of human memory.

According to this model we posses three basic memory systems: Sensory memory, Short term memory and Long term memory. Each of these systems deal with the tasks of encoding information, storing and retrieving it when needed, the details of the processes you have known earlier in this chapter. How does information move from one memory system to another? This model proposes that it involves the operation of *active control process* that act as *filters*, determining which information will be retained. Information in sensory memory enters short term memory when it becomes the focus of our attention, whereas sensory impressions that do not attract attention fade and quickly disappear. Selective attention here plays an important role. Further, information in short term memory enters long-term storage through *elaborate rehearsal*. There we think about meaning and relate it to other information available in long-term memory. Unless we engage in such cognitive efforts, information in short term memory too quickly fades away and lost. During *maintenance rehearsal* period information does not necessarily move from short term to long term memory. This model of memory is linked to the general information – processing perspective that is an important aspect of all cognitive psychology today. Many other researchers have supported the concept of the model of Alkinson and Shiffrin, hence, very useful and scientific one.

This model can be presented as under:



Source: Baron, R.A. 2001, Psychology (5th edition) Pearson, Prentice Hall

4.4 LET US SUM UP

In this chapter you have come to know the nature and characteristics of learning and memory – the two most important aspects of human adjustment. How learning takes place? Is it by observation? Or by classical conditioning? Or by instrumental conditioning? You are now in a position to provide answers. Similarly, how memory functions? You have come to know. What is sensory register? Or what is short term memory? Or what is long term memory? You understand clearly. Different processes of memory, you have come to know including information processing model. Over all understanding of the contents of this chapter makes you informed about scientific facts relating to main issues of humans.

4.5 UNIT END QUESTIONS

1) What is learning?
2) What is memory?
3) Observational learning was advanced by B.F. Skinner (True/False)
4) Classical conditioning was the outcome of:
   a) Thorndikle's experiment
   b) Bandura's experiment
   c) Pavlov's experiment
   d) Bartlett's experiment
5) Operant conditioning is based on the relation between conditioned stimulus and conditioned response. (True/False)
6) What is sensory register?
7) What is duration of short term memory?
8) Ebbinghan's work is related to
   a) Motivation
   b) Perception
   c) Thinking
   d) Memory
9) How information is processed in memory?
10) Retro-active inhibition is related to decay of memory traces (True/False)

4.6 SUGGESTED READINGS

Alkinson, R.C., and Shiffrin R.M. (1968) Human memory: A proposed system and its control process: In K.W. Spence & J.T. Spence (ed) *The Psychology of Learning and Motivation: Advances in Research and Theory*, 89-195, New York: Academic Press.

Bandura, A. (1986). *Social Foundations of Thought and Actions: A Social Cognitive Theory*. Englewood Cliffs, NJ: Prentice Hall.

Baron,R.A. (2001) *Psychology(5th. Edition),* Pearson Prentice Hall.

References

Bandura, A., Ross, D., and Ross, S. (1963) Imitation of Film-mediated aggressive models. *Journal of abnormal and social psychology*, 66, 3-11

Harrison, J.K. (1992). Individual and combined effects of behaviour modeling and cultural assimilator in cross-cultural management training. *Journal of Applied Psychology*, 77, 952-962. Baron,R.A.(2001) *Psychology*, Pearson Prentice Hall.

Skinner, B.F. (1938). *The behaviour of organisms*. New York: Appleton – Century Crofts.

Sperling, G. (1960). The information available in brief visual presentation, *Psychological Monographs*, 74.

Spooner, A., and Kellogg, W. N. (1947). The backward conditioning curve. *American Journal of Psychology*, 60, 321-34.

Thorndike, E.L. (1898). Animal intelligence: An experimental study of the associative processes in animals. *Psychological Monograph*, 2 (whole No.8).

UNIT 1 INTRODUCTION TO SOCIAL BEHAVIOUR – CONCEPT, PERCEIVING AND BEHAVING, SOCIAL INTERACTION

Structure

1.0 INTRODUCTION

We are constantly assessing and perceiving the feelings and intentions of other people and our responses are determined by these perceptions. The term 'person perception' refers to the processes by which we form impressions of other people. The impressions and evaluations of other people may not be formed through direct sensory information alone. Our subjective judgments and inferences also play a role in it. For example when we meet a person briefly, we form an impression of that individual. Such initial assessments of personality are often based on the physical appearance, verbal behaviour as well as other expressive behaviours. In such a situation, even though the available information is limited, we do form a definite impression about the personality of the person. These impressions are strong and lasting. Often we assign attributes to a person based on class or category to which he or she belongs. This phenomenon is known as 'stereotyping.' That is, we first categorise a person and place that person in a class or category and then attribute characteristics and traits as belonging to that class or category persons. In this unit we will be dealing with how impressions are formed and created, how do we perceive, how our behaviour is influenced by our perception. We will also be dealing with social interaction, how we get attracted to talk toward persons based on certain principles such as proximity, past experience with similar persons etc.

1.1 OBJECTIVES

After reading this unit, you will be able to:

- Define social perception and behaving;
- Explain the finer details of interaction in social situations;
- Describe the characteristic features of perceiving and behaving;
- Explain how we form impressions of others; and
- Analyse factors contributing to perception.

1.2 DEFINITION OF PERSON PERCEPTION AND IMPRESSION FORMATION

Person perception generally includes subjective judgments and inferences about a person that go beyond direct sensory information.

Process of registering sensory stimuli as meaningful experience is termed as perception. Perception involves complex constructions of simple elements joined through association. Perception is subject to the influence of learning. We perceive through our ears, eyes, notes, skin and tongue. Perceptions may be influenced by expectations, needs, unconscious ideas, values, and conflicts.

Person perception on the other hand deals with how people think, perceive, feel and behave in social situations.

The mental process we form judgments and draw conclusions about the characteristics and motives of other people is also part of person perception.

1.2.1 Impression Formation

Suppose you are visiting a city for the first time and have car trouble downtown in the dead of night. You begin to scan the faces of passing motorists, looking for someone who will help you get out of this jam. How can you tell who will be your Good Samaritan? Can you seek help from the carload of teenagers who has passed by twice in the past five minutes? Or should you take a chance and try to flag down the neatly dressed and pleasant-looking young man driving the 1965 Chevy... who, on second thought, bears an uncanny resemblance to the character of Norman Bates in the movie Psycho? Just as you are bemoaning the fact that you don't know anything about the people whom you are about to ask for help, something in the distance catches your eye. It is a white car with lettering and a emblem on the door, and a panel of light flashers on the roof. Inside are two people wearing uniforms and badges. Despite the fact that you are certain they are carrying loaded guns and wooden clubs, you immediately step out in the street and signal them to stop. Are you crazy? You have never seen these two people before in your life, yet you believe they will help you. Why?

How do we "size up" other people during initial encounters? How do we arrive at conclusions about their character, needs, and abilities? As these two hypothetical situations illustrate, the process of gathering information about others can be of the most vital importance to our health and safety. Every day we judge people, and often react to the based on very little information.

Impression formation is not only a dynamic process; it is also integrative. Every information about the person is interpreted within the context of all the other information one has about the individual. Each information "bit" takes its character from the other "bits" as a whole.

1.2.2 Impression Formation through Stereotyping

We identify objects in our environment according to features and attributes that distinguish them from other objects. For example, because certain objects such as roses, daffodils, and lilies share the same features and attributes (for example, petals) we place them into the same cognitive category, namely that of "flower." Humans generally engage in the initial stages of impression formation. The concrete nature of first impressions was demonstrated by Bernadette Park in 1986, when she asked graduate students enrolled in a social psychology seminar to provide weekly written descriptions of one another. Results indicated that student descriptions early in the semester emphasised behaviour and appearance ("dyed her hair pink") rather than personality traits (kind, intelligent).

This finding indicates that in forming first impression of others, people initially tend to rely upon the more superficial aspects of their personal qualities. Some of the most universally salient physical features are those based on race, sex, age, and attractiveness, Because categorising others by these physical features is done so frequently that it becomes habitual and automatic, often occurring without conscious thought or effort.

Social categorisation does not typically end with merely grouping people into different categories. Within these social categories, there are certain beliefs about

the individuals' personalities, abilities, and motives. These are often learned from others, and like other cognitive frameworks, stereotype significantly influences how we process social information.

That is, once a stereotype is activated, we have a tendency to see people within that social category as possessing the traits or characteristics associated with the stereotyped group. In this sense, stereotypes are fixed ways of thinking about people that puts them into categories and doesn't allow for individual variation. These social judgments are arrived at solely on the basis of perceiving static cues and not based on anything else about the individuals. Yet once a person is categorised into a particular social grouping, people tend to think they know a good deal more about that individual.

If people believed that every member of a particular social group possessed all the attributes stereotypically associated with it, this sort of all-or-none thinking could easily be considered irrational. Going back to our hypothetical situation of seeking help from heavily armed police officers, very few people believe that all police officers are helpful and fair-minded in their service to the community. Those who would insist that this is the case could justifiably be thought of as being out of touch with reality.

One of the essential functions of stereotyped thinking is that it is fast and gives us a basis for immediate action in uncertain circumstances. In a way stereotypes are "shortcuts to thinking" that provide us with rich and distinctive information about individuals we do not personally know. Stereotyping also appears to "free up" cognition for other tasks. Stereotyped thinking allows people to cognitively engage in other necessary activities. Stereotyping has a resource preserving effect. Since stereotyping helps spend less energy in cognitive resource, the perceiver has more energy to redirect to more pressing issues.

1.2.3 Non-Verbal Behavioural Cues

When we form first impressions, they are not only based on the relatively static cues of physical appearance and the accompanying stereotypes; they are also based on the more dynamic and fluid aspects of behaviour, Some of the non-verbal channels of communication are facial expressions, eye contact, and body movements and posture, which are dealt with in greater detail below.

Facial Expression

Facial expressions reveal a person's true feelings. Facial expressions not only play an important role in communication, but certain emotional expressions are innate and thus are understood throughout the world.

Paul Ekman and his colleagues (1987) asked participants from ten different Western and non-Western cultures to identify the six primary emotions displayed by White men and women in a series of photograph. Across cultures there was a high percentage of agreement.

Being able to read the emotions of others through facial expressions allows people to predict the other person's behavioural intentions. For example, "Do they mean to harm me?"

Reading facial expressions also helps understand how others are interpreting the world ("Why are they afraid? Are we all in danger in this situation?") At the

same time it must be remembered that all people do not attend equally to all facial expressions, but rather exhibit the most sensitivity to those that would give them the best chances of survival.

Eye Contact

People who are in love and who are in competition tend to lover or opponent respectively. This latter form of eye contact, known as staring, does not indicate amorous intentions. Rather, it is recognised as a sign of dominance seeking and aggression. Most people become tense and nervous if others stare at them, and they will withdraw from the situation in order to escape the attention. If withdrawal is not possible, people will often avoid eye contact in an apparent attempt to reduce potential conflict. This gaze aversion is often interpreted by others as a submissive gesture.

Body Movements

People who walk with a good deal of hip sway, knee bending, loose jointedness, and body bounce are perceived to be younger and more powerful than those who walk with less pronounced gaits. A number of studies have demonstrated that when people are emotionally aroused, they tend to engage in a greater number of body movements than when they are calm.

People often infer underlying emotional states by reading the body movements during social interaction. For example, in a creative analysis of dance characters in classical ballet, the researchers found that the body and arm displays of the threatening characters were more diagonal or angular, whereas those of the warm characters were more rounded. In subsequent studies, college students who were asked to evaluate various geometric shapes judged those with diagonal shape to be more bad, powerful, and active than those that were rounded. These findings suggest that people do analyse the shape of large-scale body movements to betterin order to determine another person's behavioural intentions. It appears then that body movements, in addition to facial gestures and eye contact, convey quite a wide variety of information to others that may well have a significant impact on the impression formation process.

1.2.4 Detecting Deception in the Self-Presentations of Others

Let us say that you are invited over to the home of a new acquaintance for dinner, and your host serves lentil burgers as the main course. Being a proud meat and potatoes person, you are not eager to eat the lentil burger and fill up the stomach. However, you have no intention to hurt your host and so you say that lentil burgers are excellent and thus you get served more of the same. At the same time the host is also looking at your facial expressions and comes to know that you do not very much relish the lentil burger. No matter what praise you lavish upon your host, if you look as if you're being tortured as you eat, your words are likely to be disregarded.

This tendency to tune into the silent language of nonverbal behaviour when we believe others are attempting to deceive us is a common strategy employed in judging social reality. Under such circumstances, people pay more attention to others' facial expression, than body posture, and least of all words.

Apparently we assume that nonverbal information is more likely to reveal one's true feelings because it's less likely to be consciously controlled than is verbal

information. In an analysis of accurate and inaccurate judge of deception, Ekman and Maureen O'Sullivan (1991) found that the inaccurate judges (30 percent accuracy or worse) focused on verbal cues, whereas the accurate judges (80 percent accuracy or better) attended more to nonverbal clues. Although attending to nonverbal behaviour can improve one's ability to reveal the "lie" in the self-presentations of others, not all nonverbal cues are equally instructive in this regard. Smiling is a case in point. People tend to believe that others do not smile when they lie. In fact, smiling is a common device used by deceivers to hide their true feelings.

Despite these attempts at self-control, the face can reveal the lie for the acutely attentive perceiver. Before people can monitor and mask their facial expressions following an emotion provoking event, they emit micro expressions. These expressions are fleeting facial signals lasting only a few tenths of a second, and are difficult to suppress. Due to the difficulty in masking this observable expression of emotion, micro expressions can be quite revealing about one's actual state of mind. The eyes can also reveal the lie. When individuals avoid the gaze of others, or blink frequently, this may be a signal of deception.

Besides the face, we also rely on the sound of another's voice and the subtle movements of the body. When people deceive, the pitch in their voice often rises slightly, and their speech is filled with many pauses and other sentence hesitations. Deception is also signaled by fidgety movements of the hands and feet, and restless shifts in body posture.

1.2.5 Forming Personality Impressions

Park (1986) investigated into how graduate students formed impressions of fellow classmates, in the early stages of this process, people make use of easily observable physical and nonverbal information. Although this reliance on superficial personal qualities is typical during the course of initial social encounters, it generally gives way to another level of impression formation as the interaction progresses. In her analysis of the graduate student's descriptions of one another, some of these more descriptive characteristics are traits, which are stable personal qualities such as "intelligent," "kind," and unscrupulous, because traits are so commonly used by people in forming impressions. Social psychologists have attempted to understand how they are combined to form a meaningful picture of a person.

1.2.6 Central Traits and Forming Impressions

This is based on the assumption that all traits are equally important in the impression formation process. However, research by Solomon Asch in the 1940s indicates that not all traits are created equal, and therefore a simple averaging model will sometimes not account for the final overall impression. Asch believed that certain traits exerted a disproportionate influence on people's overall impressions, causing them to assume the presence of other traits. He called these dominant traits central traits.

In his classic study. Asch (1946) told participants they would hear a list of discrete traits that belonged to a particular person and that they should try to form an impression based on this information. For some participants, the following traits were then presented: intelligent skillful-industrious, warm determined, practical, cautious. For other participants, the trait warm was replaced with trait cold, but

otherwise everything else was identical. Those who had been told that the hypothetical person was warm rated him as significantly more generous, humorous, sociable, and popular than those who had been told that he was cold.

Based on these results, Asch concluded that warm and cold are central traits that significantly influence overall impression formation. In a warm and caring individual, being industrious and determined would likely carry positive connotations, but in a cold and heart-less individual these same traits carry very different, more negative, connotations.

In and elaboration of this research, Harold Kelley (1950) attempted to determine how these same traits might influence impression formation in a real-life situation. When students arrived at their college psychology class, they were greeted by a representative to the instructor who told them they were to have a guest lecturer that day because the regular instructor was out of town. The representative led some students to believe that the soon-to-arrive lecturer was a rather warm person, and other students were led to expect a rather cold individual. The lecture then appeared and led the class in a 20-minute discussion. Results indicated the those given the "warm" pre information not only rated the lecturer positively but also the lecture as good . On then other hand those who were told the lecturer will be cold rated the lecture also not interesting and rated then lecturer somewhat negatively.

Self Assessment Questions

1) Explain person perception in your words.

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2) What are the non verbal channels of communication? Explain each of them.

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1.3 BIASES IN PERSONALITY JUDGMENT

1.3.1 Implicit Personality Theory

Assumptions or naïve belief systems that we have about the associations among personality traits have been called an implicit personality theory. In this implicit theory of personality, there is a strong tendency for people to assume that all good things occur together in persons and that all bad things do so as well, with little overlap between the two.

In implicit personality theory one believes that if a particular trait is seen in a person, that person must be having other traits associated with it. Thus, many people might perceive that someone like Mr. JRD Tata, who had been described by friends and employees in such glowing terms, could not be guilty of doing anything wrong leave alone indulging in sexual harassment. This conclusion is arrived at is consistent with their original idea that a person like JRD Tata cannot be all that negative. In such cases, even when contradictory information is made available, we still generally persist in viewing people as either consistently good or bad. In this effort toward consistency, we will often distort or explain away contradictory information.

1.3.2 Self-Concept and the False Concept Bias

Just as we tend to associate one trait with another, the kind of self concept that we have of ourselves also influences our impression formation. This tendency to exaggerate how common one's own characteristics and opinions are in the general population is known as the false consensus bias. Here the self-concept is the grand portrait we paint of ourselves. We paint of others by incorporating many of these same characteristic qualities. Just as painters have a distinct style that can be recognised from one painting to the next, so too do we all have distinctive styles of portraying ourselves and those around us.

1.3.3 Positivity Bias

Another general evaluative bias operating in impression formation is to view people in favourable light. Known as the positivity bias, it is the tendency for people to evaluate individual human beings more positively than groups or impersonal objects. For example, in an analysis of more than 300,000 teacher evaluations, David Sears (1983) found that students rated 97 percent of their instructors as "above average," despite the negative experiences students often have in college classes.

Why do we evaluate people so leniently? One possibility is that we feel better surrounded by good things, pleasant experience, and nice people, and therefore are motivated to see the world and others through "rose-colored glasses," A second possible explanation is that compared to groups or impersonal objects, people regard other human beings as relatively similar to themselves, and similarity heightens attraction.

1.3.4 Negativity Bias

As pointed out in the pre paragraph, people are biased toward perceiving other in a positive light. However, if they learn that someone has negative traits, then they place more weight on these unfavorable attributes in forming an impression of the person. Known as the negativity bias, it is the tendency of people to give more weight to negative traits than to positive traits in impression formation.

This tendency to direct attention to negatively evaluated stimuli, like the tendency to notice fearful and angry faces in a crowd, is believed to have survival value for human beings.

1.3.5 Primacy and Recency Effects

This is the tendency of a person to give more weight to the information that a person gets first about the individual rather than to information received later.

This is called the primacy effect. This effect was impressively demonstrated by Edward Jones and his colleagues (1968). They conducted a study in which participants observed another person (a confederate) completing a 30-item test of intellectual ability. As the confederate gave each answer, the experimenter publicly announced whether his response was correct. The confederate always answered 15 question correctly, but in one condition he would start off with many right answers and then end with may incorrect answers. In another condition, just the opposite would occur. At the end of the test, the participants were asked to predict how well the confederate would do on the next 30-item test, and to rate his intelligence, Even though the confederate always answered 15 item correctly, he was rated as more intelligent and more likely to do well on the next test if he had started off with a number of correct responses rather than started off with a number of incorrect ones.

Why does early information figure more prominently than later information in our impression of others? One possible explanation is that the early bits of information we learn about another provide a cognitive schema or mental "outline," This we use to process later information. If the later information contradicts this schema, we are likely to ignore it. Research suggests that the primacy effect is particularly strong when people are given little time to make judgments and are not under a great deal of pressure to be correct.

Although the primacy effect regularly occurs in social perception, it can sometimes be reversed if people are warned against making hasty judgments or told that they will be asked to justify their impressions of a target person. In such circumstances, the last bits of information learned may be given greater weight than earlier information. This is known as the recency effect.

Thus, if you have a shy friend whom you'd like to introduce to a potential romantic partner, you might guard against the primacy effect in the following manner. You could inform this person that your friend is somewhat shy and that her true personality doesn't always shine through in first meetings. If this person takes your advice, he will ignore some of the early awkwardness and social fumbling in the friend and pay more attention to what he learns about her after she feels more comfortable with him.

1.3.6 Making Attributions

In the way of an example, let me describe an unexpected experience of my own. After heavy rains in Delhi, I came back home from work and I found that the trash bag that I had kept outside had not been removed which is normally done by a person sent by the resident welfare association. So I rang up the person at the Resident Welfare Association and lodged a complaint that the trash had not been removed and that the monkeys have strewn the trash all over. The man at the counter told me rather sarcastically that after the heavy downpour people would not be stupid enough to keep their trash outside for picking up. I was shocked to get such an answer. Later, however, in thinking about the person's rude reply, I wondered what caused him to act in that manner. Was it that he was simply an insensitive person, or ill-suited for a job in which he answers calls from inquiring customers? Or perhaps, after the umpteenth call from confused and sometimes angry customers, his patience had eroded to the point where he finally vented his frustrations on the next caller, which was me.

Now one year later when the trash was not picked up, and I dialed the number, a very courteous reply came and he even apologised for having caused inconvenience and said that the man to pick up the trash will be right there in a few minutes. Now based on this second conversation, I have concluded that the man's behaviour toward me last year was most likely not due to some stable personality trait like "rudeness," but rather to an external, uncontrollable, and unstable event, that is the the situational stress she experienced on that terrible rainy day.

1.4 HEIDER'S NAIVE PSYCHOLOGY

According to Heider, everyone has a naïve psychology according to which everybody has a general theory of human behaviour which they use to search for explanations of social events.

In seeking attributions, Heider believed people are motivated by two primary needs:

i) the need to form a coherent view of the world, and

ii) the need to gain control of the environment.

Being able to predict how people are going to behave goes a long way in satisfying both of these needs. If we can adequately explain and predict the actions of others, we will be much more likely to view the world as coherent and controllable than if we have no clue to their intentions and dispositions.

1.4.1 Primary Dimension of Causal Experience

According to Heider, people broadly attribute a given action either to internal states or external factors. An internal attribution consists of any explanation that locates the cause as being internal to the person, such as personality traits, moods, attitudes, abilities, or effort. An external attribution consists of any explanation that locates the cause as being external to the person under scrutiny, such as the actions of others, the nature of the situation, or luck.

In the example of trash that was given in the earlier paragraphs, the man's actions were attributed by me to external factors. brought by adverse weather.

Bernard Weiner and his colleagues expanded Heider's primary distinction between the internal and external locus of causality to include questions about stability and controllability. Stable causes are permanent and lasting, whereas unstable causes are temporary and fluctuating. This stable/unstable dimension is independent of the direction of causality. Some causes, called dispositional, are both internal and stable. ("She insulted me because she is rude"). Other cause is considered to be internal but unstable ("She insulted me because she has a headache"). Likewise, some causes are seen as external and stable ("She insulted me because I, the external factor, rub people the wrong way"), whereas others are perceived as external and unstable ("She insulted me because the weather conditions that day made her job very difficult").

There is also a third dimension we often consider is the controllability of these causes. According to Weiner (1982), we think of some causes as being within people's control and others as being outside their control. The controllable/

uncontrollable dimension is independent of either locus or stability. Weather is a good example of an uncontrollable factor.

Let us take an example of studying for examination. How much one studies for the examination would be considered internal, stable and controllable factors.

On the other hand how much one chooses to study depends on internal, unstable and controllable factors. Sometimes a controllable factor like effort will only get you so far in academic achievement. Then we must consider internal factors that are seen as uncontrollable, such as innate intellectual ability (stable) and one's mood during exam time (unstable).

External factors that are considered controllable might be rather stable, such as knowing that the person's teacher looks for specific definitions of terms and use of examples in test answer. Or they might also be unstable, such as others deciding to help the individual prepare for an exam (this help is presumably under their control). Finally, the difficulty of tests given by the teacher would be perceived as being external, stable, and uncontrollable, whereas luck is an external, unstable factor typically perceived as uncontrollable.

Since Heider's initial formulations, other social psychologist have expanded upon his insights and developed formal attributions theories.

Self Assessment Questions

1) How does positive bias and negative bias impact on formation of an impression of the person.

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2) According to Heider what are the two primary needs which motivated to the people?

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1.5 THEORIES OF ATTRIBUTIONS

1.5.1 Correspondent Inference Theory

When people watch the actions of others, they not only attend to the behaviour itself but are also aware of the consequences of the behaviour. In developing correspondent inference theory, (for example, why did the Resident Welfare Association man act rudely with me?). For example, if Mr. X acts compassionately

toward Mr. Y., his correspondent inference would be that Mr. X is a compassionate person. But will Mr Y., actually make a correspondent inference? Not always, if there is only one plausible reason to explain the act, correspondence is high and you will be confident in your attribution.

In explaining social events, people have a preference for making dispositional attributions (that is, those that are internal and stable), and that external attributions are merely default options made only when internal causes cannot be found. The reason for this preference is the belief that knowing the dispositional attributes of others will enable one to better understand and predict their behaviour.

However social behaviour being ambiguous, and the causes not being so obvious, one cannot make attributions with much confidence. Therefore, to guide them in their attempts to inter personal characteristics from behaviour, Jones and Davis stated that people use several logical rules of thumb.

1) **Social desirability of the behaviour**

One such rule deals with the social desirability of the behaviour. That is, people are much more likely to make dispositional attributions about behaviour that is socially undesirable than about behaviour that is desirable. This is the case because socially desirable behaviour is thought to tell us more about the cultural norms of the group than about the personality of the individuals within that group. When such action is taken, people realise that the social costs incurred by the actor may be great, and they are much more confident that the behaviour reflects a stable and internal disposition.

2) **Degree of choice one has**

Actions freely chosen are considered to be more indicative of an actor's true personal characteristics than those that are coerced.

3) **The chosen behaviour of the individuals**

This is the third rule in that not only do we observe the social desirability of behaviours and the degree of choice of the actors, but we also analyse the actor's chosen behaviour in the context of other actions not taken. People can often infer the strength of the underlying intention by looking for unique or "noncommon" consequences. This third rule of inference then, has to do with actions that produce noncommon effects, that is the outcomes that could not be produced.

Taking these rules into account, according to Jones and Davis' theory, people are most likely to conclude that other people's actions reflect underlying dispositional traits (that is, they are likely to make correspondent inferences) when the actions are perceived to (1) be low in social desirability, (2) be freely chosen, and (3) result in unique, noncommon effects.

1.5.2 Kelley's co Variation Theory/Model

This theory is generally applied only to single observations of behaviour and only details the cognitive processes for making dispositional attributions. Many of our causal explanations are derived from an extended analysis of others and often result in attribution of causality external to the actor.

One theory that specifically attempts to explain attributions derived from multiple observational points and details the processes for making external as well as internal attributions is Harold Kelley's (1967) co variation model.

Kelley was also of the view that human beings are rational and logical observers, acting much like naïve scientists in the manner in which they tested their hypotheses about the behaviour of others. According to Kelley, people make attributions by using the co variation principle. This principle states that for something to be the cause of a particular behaviour, it must be present when the behaviour occurs and must be absent when the behaviour does not occur. In other words, the cause and observed effect must "co vary."

Whenever there are several possible causal explanations for a particular event, we tend to be much less likely to attribute the effect to any particular cause.

In assessing co variation, Kelley stated that people rely upon three basic kinds of information. (i) Consensus information. This deals with the extent to which others react in the same way to some stimulus or entity as the person whose actions we are attempting to explain. (ii) Consistency information concerns the extent to which the person reacts to this stimulus or entity in the same way on other occasions, (iii) The distinctiveness information refers to the extent to which the person reacts in the same way to other, different stimuli or entities.

Suppose while lecturing the teacher finds one of the students fast asleep. The teacher wonders why the student slept, was it the lecture was boring? Or was it that the students had late night and did not sleep? The co variation model prefects that the teacher would seek an attribution by gathering consensus, consistency, and distinctiveness information. For consensus, he would look at the behaviour of his other students, that if all others also sleep. To find out the consistency factor, whether this student slept in the class also in the past. To decide about the distinctiveness, whether the he student's behaviour in other professors' classes also was the same (sleeping). Or does he fall asleep only in this teacher's class.

Both correspondent inference theory and the co variation model have significantly advanced the original insights of Heider by attempting to better understand how people make inferences about the causes of behaviour. In its original form correspondent inference theory dealt primarily with assigning meaning to single instances of behaviour, whereas the co variation model was designed to finds out how meaning is assigned to a sequence of behaviour over time. Both theories assume that people are rational and logical observers, acting like naïve scientists by testing hypotheses about the location of causality for social events. Yet how logical are we really in our daily attributions?

1.5.3 Biases in Attribution

Behaviour is generally caused by an interaction of an individual's internal characteristics and external factors. However, in explaining other people's actions, we tend to locate the cause in terms of their dispositional characteristics rather than to what might be more appropriate situational factors.

Consider one example of this particular cognitive bias in operation. Ross and his colleagues (1977) devised a simulated TV quiz game in which students were randomly assigned to serve the role of "quizmaster" or " contestants ." the

quizmasters were told to think up ten challenging but fair question, and the contestants were told to answer as many of them as they could. Under such conditions the contestants answered only four of the ten questions correctly. Despite the fact that the quizmaster role gave students playing that part a decided advantage, the contestants failed to discount or take this external factor into account in assigning a causal explanation for the quiz show's results. Contestants saw the quizmasters as far more knowledgeable than themselves, even though they knew the quizmasters had enjoyed the great advantage of controlling what questions were asked in the quiz. Observers who watched the game, but were not directly involved in the outcome, also rated the quizmasters as more knowledgeable than the contestants.

1.5.4 The Role of Perceptual Salience

Why do people tend to engage in this sort of systematic bias? One possibility is that when another person is observed in a social setting, what is most perceptually salient is (i) that particular person (ii) their dynamic movements (iii) their distinctive voice, and (iv) their overall physical presence. In comparison, the relatively static external forces that may actually cause those behaviours are less salient and therefore less likely to be factored into the attribution equation.

Individualism, or a combination of these and other factors explain the fundamental attribution error. This particular bias can have significant social consequences. Attributing the behaviour of others to internal factors allows social perceivers to block the actor's attempts to deny responsibility for negative events with which he or she is associated. For example, the tendency to disregard situational forces in explaining the plight of victims within our society (for example, rape victims,, street people, disadvantaged minorities) can result in a decidedly less-than-sympathetic response, because we hold these people responsible for their condition due to "bad" dispositions.

Even if our response is one of sympathetic caring for unfortunate others, the assignment of dispositional blame will influence the type of solutions we as a society implement for these people. That is, if we attribute the difficulties of unfortunate others to personal defects rather than to their circumstances, it is likely that the treatment programs will focus on changing individuals and not on improving the conditions of their social environment. Yet if the individuals in these treatment programs are members of particular social groups in which failure is often due to discrimination rather than to personal defects (like ethnic minorities and women), our attempted interventions may prove to be psychologically damaging.

1.5.5 The Actor-observer Effect

When explaining the actions of others, we are especially likely to commit the fundamental attribution error. But when explaining our own behaviour, we tend to give more weight to external factors. This tendency to attribute our own behaviour to external causes but that of others to internal factors is known as the actor-observer effect. For example, if Meenakshi is having a conversation with an attractive male stranger and her boyfriend, Arun sees them from a distance, they may well arrive at different explanations for this social interaction. Although Meenakshi may attribute it to an external factor (the stranger was asking for directions), Arun may assign an internal cause .

Whatever cross-cultural studies may find in the future, the self-esteem maintenance explanation is appealing in that it can also provide insight into how self-serving biases extend beyond ourselves to include our explanations of individuals or groups with which we identify. Self-esteem can be reinforced by associating ourselves with the success of others. In a psychological sense, those others with whom we strongly identify are part of our self-concept. In addition to the self-esteem maintenance explanation, a second and more recent proposition claims that what is called the self-serving bias is actually a very rational information processing outcome. These so-called "self-serving" attributions stem from our expectations for success in given situations.

The basic argument here is that people generally expect to succeed and therefore are more willing to accept responsibility when it occurs. Based on Kelley's covariation model, this explanation contends that when people do succeed, the success is low in distinctiveness and high in consistency. Therefore, people will make an internal attribution.

In summary, then people tend to assume more credit for success than responsibility for failure, and the most common explanation for this effect is motivational, that is a desire to enhance and protect self-esteem.

1.5.6 Social Perceivers Being Good or Bad

There are two different perspectives of human beings as social perceivers; first, there is the view of such attribution theorists as Heider and Kelley that people are reasonable and rational judges of social behaviour.

Then there is the perspective of Tversky and Kahneman that we are cognitively "lazy" and susceptible to a number of biases that distort our view of social reality. Whether it is in first impressions, one-shot attributions, or attributions derived from multiple observations over time, there are many points in the social judgment process at which problems can arise. Overall, it appears as though human beings are not as rational in their information processing as once thought by attribution theorists.

In a complex and ever changing world, given that we are so predisposed to make such a wide variety of errors in social perception, the question arises as to how do humans manage. One possible answer is that our social world is much more flexible and dynamic than the static and artificial laboratory conditions that characterize social psychological research.

In a laboratory study, once a research participant makes a judgment error, it becomes a "data point," frozen in time, but in the course of everyday life, people are constantly revising their social assessments due to feedback from the environment.

As a result of this flexibility, many of the social perception errors committed in the "real world" are corrected through normal interaction with others. For example, someone may meet you and, based on that limited encounter, form a certain impression of you. Another person, upon hearing of that impression, may provide new meaningful information that "redefines" you in the first person's eyes. This evolution of social reality is ongoing and can be extremely forgiving of individual judgments errors, so that others can arrive at an "efficient definition" of you that can be used in the social world. Consistent

Another perspective on cognitive errors that has recently been given greater credence is that these "mistakes" are actually often beneficial to the person's health and welfare. According to this view, an important reason for these errors is that unlike computers, people have an investment in their own self-beliefs and their beliefs about others, making motivational biases likely in social perception. Through such biases we often can justify our self-concepts and our world view, making it possible for us to more confidently engage in social interaction and meet daily challenges. These cognitive biases may often create a healthier psychological buffer from some of life's harsher realities than a more rational mode might.

In the final analysis, our judgments of other should not be expected to be any more accurate or efficient those are our judgments of ourselves. Just as we have a need for consistency when assessing our own self-beliefs, we also express that need in social perception. When we are faced with contradictory information, our inclination is to distort or explain away the contradictions.

1.6 SOCIAL INTERACTION

The give-and-take between individuals in social situations is an interaction process. People do not merely react to other people with whom they meet, talk, and have dealings, but they also themselves constitute stimulus patterns for others. What they respond to in their words and deeds at a given moment is partially determined by how they have affected people previously. Interaction among persons is an ongoing process of reciprocal influence.

Have you ever observed a person who thought that he was completely alone? He may act very differently than he does when at an office, school, or social gathering.

The problem may be defined operationally for study purposes. We shall define the differential effect of a social situation as the difference between behaviour when an individual is in a social situation and when he is alone. This operational definition can be put into a simple formula:

$$D.E. = Bs - Ba$$

Where Bs refers to behaviour in a social situation and Ba to behaviour alone. D.E. = Differential Effects

The difference defines the differential effects (D.E.) of a social situation.

You will note that the differential effect has a positive sign if the social situation produces an increase in intensity, quantity, or quality (improvement). Conversely, it may have a negative sign under opposite situations.

The differential effects of two or more social situations may also be compared as given below

$$D.E. = Bs1 - Bs2$$

What produces differential effects in a social situation? We learned as a general principle that psychological patterning, hence behaviour, is always a product of interacting influences from the environment and from the participating person.

The individual is selective in what he responds to at a given time, and his selectivity is keenly tuned to other persons, From birth onward, other people

have satisfied or frustrated his physiological needs, cared for him or abused him, and played a crucial part in his definition of himself as a person.

1.6.1 Interdependent Sets of Factors in Social Situations

In any social situation, the frame of reference for analysing behaviour must include at least the following sets of factors, which include the following:

i) Factors related to the characteristics of the individuals, such as their number, ages, sex, educational level, occupations, social status, etc,

ii) The background of cultural situations to which the individuals have been exposed.

iii) Factors related to the homogeneity and heterogeneity of the participants' characteristics.

These factors are included because interaction is not governed automatically by the background and characteristics of each individual. Differences in age, sex, race, religion, or social class affect interaction as soon as they are perceived.

1.6.2 Factors Related to the Prevailing Relations Among Participants

This important classification recalls the distinctions made within the first major class of social stimuli. Other people may be strangers or they may have an established interpersonal relationship say, as a spouse.

They may be fellow members of the same group (family, chums, club)., members of different groups, or

They may form varying combinations in terms of group membership. They may be participating in a collective interaction situation.

1.6.3 Set of Factors Pertaining to the Characteristics of the Activity, Task, Problem, or Occasion at Hand

People work, play, attend weddings, make decisions, and solve problems. The tasks required in these activities have definite characteristics. A ceremony, attending a lecture, assembling a table from its parts, and many other tasks allow very few alternatives for the behaviour of participants. They are structured in terms of the actions required and their sequences.

On the other hand, decisions about problems of discord in human relations, or interpretations of a person's expression provide considerably more lee way for alternative actions.

Such tasks lack objective structure in varying degrees. Included in this set of factors are communications or instructions relative to the problem or task.

At times, the person's cultural background defines the task or problem for him. At others, there are also explicit instructions from other persons as to how to he have or to interpret the problem. In experiments, instructions by the experimenter serve this purpose.

1.6.4 Set of Factors Pertaining to the Location and Facilities

Interaction does not take place in a vacuum. Material culture provides many different locations and facilities, some of them specific to certain activities, Cultural norms define appropriate places for interaction and task performance, There are appropriate and inappropriate settings for making love, for worshipping, for learning, and for working. There are tasks and problems that cannot be solved unless certain facilities are available. Some locations are crowded by other people not participating in the interaction. Others are so noisy that conversation is impossible. As we shall see, a psychological laboratory with equipment, recording instruments, one-way mirrors, and assistants in white coats produces a distinctive atmosphere that unmistakably affects the interaction of research subject and experimenter.

1.6.5 Set of Factors Pertaining to the Individual Participant's Relation to the Above Three Sets of Factors

The frame of reference for a social situation is not complete without the system of relationships defining the individual's standing with regard to other individuals present, his attitudes and abilities with regard to the task, his established notions, his immediate impressions, and his use of the location and facilities. Past experiences, motives, and moods affect his behaviour relative to the other persons, the problem, and the location.

These four sets of factors provide a scheme for analysing the frame of reference in any social situation. Each of the four sets of factors has demonstrable effects on behaviour, but variations in any one factor need not produce one-to–one changes in behaviour. The factors in a social situation are interrelated, hence function interdependently. The social situation forms a pattern of stimulation through the selective processing of an individual with a cultural background, with motives and attitudes relevant to the situation.

1.6.6 Differential Effects of Social Status

Allport studied performance in a variety of tasks when each person worked alone in a room and when he worked side-by-side with three or four other persons. Instructions were given not to compete with others. The tasks included vowel cancellation, attention to reversible perspective, multiplication, association, perspective, reasoning, and judgment of weight and odors.

Allport found differences between performance alone and together. The magnitudes and signs (plus or minus) of the differences varied from task to task. In general, in the social situation there was an increase in speed and quantity of performance on the simpler tasks. In reasoning, Allport reported a lowering of quality in togetherness situations for six of the nine subjects and increase in quality for the other three. In judgments of odors and weights, there was a tendency to avoid extreme judgments in the together situations. In short, differential effects of social situations occur even when there is no deliberate effort by anyone to influence behaviour.

1.6.7 Awareness in "Verbal Conditioning" Experiments

For example, during an interview, and experimenter murmurs "mmm-hmm" or "right ' whenever the subject utters plural nouns, personal pronouns, or another

selected class of words. Increase in his use of the selected class of words is attributed to the experimenter's 'reinforcement." Lights, bells, or buzzers have also been used to "reinforce" a selected class of words.

What is being studied in experiments on verbal conditioning? Researchers are finding that the phenomena are differential effects of a social situation, in which the experimenter's verbal "reinforcement" is only part of the picture. In other words, what is being studied is not comparable to the formation of conditioned responses in animals. but represents a temporary adaptation to a social situation by an experiencing individual.

1.6.8 Milgram's Experiments on Reactions to Authority

The differential effects on behaviour produced by a researcher's instructions and requests are examples of response to authority perceived as legitimate; we know that in social life much of our behaviour is influenced by persons with legitimate authority over the running of daily affairs. We are inclined to behave the way they expect us or order us. If our automobile is halted by a policeman who directs us to turn into another street, we usually assume that the order is given to protect us or other persons. We comply, whether it is convenient or not. However, some directives by persons in authority go strongly against the gain of those subjected to them. One might suspect that a directive to administer pain to a fellow human being would be objectionable to most people. In a series of experiments, Milgram (1963, 1965) utilised the authority of a research figure to investigate this problem.

Acting "In the name of Science…." Milgram studied the conditions in which Ss would agree or refuse to administer increasingly severe electric shocks to another person when that person erred in learning a list of paired words. The learner was actually in league with E, having instructed to give wrong answers and to demand with increasing insistence as the shock increased that the experiment be stopped.

The shock generator (which actually only delivered a sample shock to convince S of its authenticity) was marked from 15 ("slight shock") to 450 volts ("danger: severe shock"). S was instructed to drill the learner and to increases the shock on each error. At 300 volts, the learner refused to answer and demanded to be freed. E commanded them to continue. S's score was assigned on the basis of the maximum intensity he delivered, a score of 30 representing the highest voltage and 0 representing unwillingness to administer any shock. Ss were mature males in samples stratified by age and socio-economic rank.

The first condition studied was proximity of the learner. The decrease in the average intensity of shock delivered when the "victim" was in another room (but pounded on the wall,) when only his voice could be heard, when he was 1½ feet away, and when S was ordered to force the victim's hand on the shock plate after he had removed it. In the latter variation, 70 percent of the Ss refused to continue the experiment, as compared with 34 percent when the victim was in the next room.

Similarly, the physical presence of E was found to be a particularly important factor: compliance with instructions decreased markedly when E was out of the room, even though he gave orders by telephone. Some Ss reported they had administered the shock when in fact they had not.

By moving the experiment from Yale University to an office building in another town, Milgram hoped to assess the effect of the experiment's location. The experiment was presented at the work of a firm called "Research Associates" (which probably is a prestigeful title.). At yale, 65 percent delivered the maximum shock while 48 percent did so in the office building.

In the early stages, Milgram was sufficiently surprised at the extent of compliance with demands to increase the shock that he made a check to see whether other competent persons would have anticipated the results. He described the experimental setup and procedures to 40 psychiatrists, asking them to predict the percentage who would increase the shock to each level. The predictions underestimated considerably the amount of shock actually administered. The psychiatrists predicted that only about one-tenth of a percent would deliver the maximum shock, while an average of 62 percent actually did.

Milgram attributes the predictive error to a concept in human action as determined by motives apart from the properties of particular situations. He points out that his experimental situation presented highly authoritative pressures on S to continue a task for which they were paid.

Milgram's research and interpretation illustrate the value of studying the interaction of all sets of factors in a social situation, including the individual's motives and uncertainties relative to it. (Note: Milgram conducted a careful procedure after the experiment to assure Ss' well-being when they left the laboratory.)

In Milgram's experiments, the presence of two planted subjects who refused to continue the experiment substantially reduced compliance by the naïve Ss, 90 percent of whom also refused. If the other persons had been fellow members of a group whose values opposed inflicting pain, there are good grounds for predicting unanimous refusal.

Milgram's research represents imaginative use of the special properties of an experimental situation for investigation of a significant problem, namely, the determinants of obedience to an authoritative command that runs counter to human values, Its contribution is to demonstrate the importance of varying factors in the situation (such as proximity, location, and social support) in producing behaviour that the individual would not ordinarily engage in or inrelnforcing his qualms so that he refuses. It shows decisively that in this jet age, people can be induced to go to great lengths in the name of science, but that there are some who still say, "I'll go so far and no farther."

1.6.9 Actions of Other Persons Like Ourselves

As was evident in Milgram's experiments. The actions of other persons similar to the subject are particularly salient aspects of a social situation. Especially when the task is ambiguous (unstructured), decisions by others similar to oneself is frequently the major standard (anchor) for our own behaviour.

Do the actions of casual acquaintances or total strangers affect our behaviour when we do not know that we are in a research situation? This question was investigated by varying the decision made by a stranger in the natural setting of a college library.

The problem studied by Rosenbaum and Blake (1955) was the effect of another person's response on and individuals decision whether or not to serve as a voluntary subject in an experiment. An assistant to E chose a set in the library among a number of other students. He appeared to be just another student at work. Five minutes later, E approached the table and asked the assistant to take part in an experiment, speaking just loudly enough that others could hear the request. When the assistant accepted, he followed E from the room and retuned in four minutes. In another condition, the assistant replied "No, I'd rather not" and turned to his books. The critical S was the person sitting next to the assistant, after the assistant had either accepted and returned to the table or had refused, S was asked to participant in the same manner. As a control, the assistant was eliminated and E approached S directly. The following shows the number of naïve Ss who volunteered under each of the conditions:

Blake reported that one S agreeing to serve when the assistant refused said that he was interested in psychology and had been hoping to have the opportunity to serve as subject. The example of prior attitude reminds us of the importance of internal factors in the frame of reference. If the experiment had been performed during final examination week, the assistant's compliance or refusal might have had very little effect.

1.6.10 Agreement with Another's Judgment in Situations Varying in Structure

When objective structure is lacking, the spoken judgment of other persons have pronounced effects, even though no deliberate attempt is made to exert influence, The individual comes to perceive the situation in line with the views of the others, and is frequently unaware that he has been influenced.

Another factor that can affect whether S will be influenced by the spoken judgments of another person in a highly unstructured situation is his feeling of certainty-uncertainly or confidence-lack-of-confidence in his judgments. In general and unstructured situation arouses uncertainly in some degree-unease and even anxiety in extreme cases. Measures that reduce the uncertainty also reduce the likelihood that S will adopt the standard provided by another person. For example, when S is told either that his judgments are correct and/or that the other person is unreliable in performing such tasks, he is unlikely to be influenced by the judgments of the other person.

1.6.11 Moving with the Crowd has Limits

Asch (1956) studied the social conditions conducive to resisting or complying with the spoken judgments of others in an experimental situation when these judgments are perceived as contrary to fact. The basic procedure was as follows: A naïve S along with seven other college students was instructed to match the length of a standard line with one of three other lines. In fact, the other Ss were pre instructed to select the wrong line on certain trails. On the first two trials, they selected the correct line. On the third, they all selected a line ¾ inches longer than the correct match; on the fourth a line 1 inch shorter, and so on. The difference were sufficiently clear-cut that Ss matching standard and the comparison alone erred very seldom.

Asch's question was: what would happen when social consensus contradicted clear-cut perceptual evidence? He found that 32 percent of the total estimates on the critical trials (when the majority erred) were errors in the direction of the majority, However, individual differences were great, of 50 naïve Ss, 13 did not err at all, 15 made one to three errors in the majority direction, 7 made four to five, 11 made six to nine errors, and only 4 Ss made 10 or 11 errors out of a possible total of 12.

Of those who went along with the majority. Asch found very few who were not aware that their estimates erred toward the majority. The remainder squared their experience with their actions by deciding that there must be some illusion or inadequacy in their own perception, or that it was better to be wrong than appear "different" in the situation. Most of those who did not err reported considerable discomfiture and conflict at the experience, despite their conviction that they were correct.

In short, Asch's experiments show that, despite severe jars to the person's confidence, there are limits to the extent of influence that can be exerted by a majority in a transitory social situation. These limits are determined by (1) the objective differences between the stimuli (smaller differences being more unstructured); (2) the extent of the discrepancy between the correct choice and the choice of the majority; and (3) the presence or absence of person's giving erroneous judgments and their number.

Self Assessment Questions

1) Describe correspondent inference theory.

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2) Explain role of perceptual salience.

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3) What is social interaction?

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1.7 LET US SUM UP

The process of perception enables us to understand the physical world and respond to it in a meaningful way. However, besides the physical environment, perceptual processes are also involved in our understanding of people, which in turn shape our social interactions in various situations in life. Impression Formation is the process by which one integrates various source of information about another into an overall judgment. The process of forming impressions is viewed by social psychologists as a dynamic one with judgments being continually updated in response to new information. It is analogous to building a "working model" of a person and then using this as a guideline in your actions toward him or her. The model works if your mental representation of the person accurately predicts his or her behaviour.

The natural tendency to categorise is applied to people as well as things, a process called social categorisation. As much as some of us may desire to only respond to other people based on information we have personally learned about them as individuals, the complexity of our social environment often makes this an impractical—even undesirable—task. Sometimes our impressions are based on the information others verbally communicate to us, whereas at other times we rely upon another form of information gathering, namely, nonverbal behaviour, Nonverbal behaviour involves communicating feelings and intentions without words. For example, whether a person smiles when greeted by another, whether a person's walk is "bouncy" or "purposeful." Or whether one's gestures are expansive or constricted can provide important information in developing a working model of those we meet on a daily basis. When Darwin proposed the certain expressions are universally understood, it was within the context of introducing evolutionary theory to the sciences. He believed that this ability to recognise emotion from the observation of facial expressions was genetically programmed into our species and had survival value for us. Another nonverbal cue figuring into our impressions of others is eye contact. Besides facial cues, the body as a whole can convey a wealth of information. Besides providing information about one's level of vulnerability, attention to body movements can also provide useful clues to a person's level of emotional arousal, Perhaps you have observed that when people become nervous they often spend a good deal of time touching, scratching, or rubbing various parts of their bodies. Erving Goffman (1959) contended that when we judge other people's self-presentations. We pay attention to two different types of social stimuli, which he called expressions. First, there are expressions that people freely "give" to others in what is typically thought of as their traditional communication patterns. These expressions given consist of verbal and nonverbal symbols that people are consciously aware of transmitting. Besides these strategic gestures, there are also expressions that people "give off." Park found that as the students become better acquainted during the course of the semester, they began to incorporate more detailed and descriptive information into their impressions. In other words, as more information is learned about other individuals, impressions of them become more abstract and less tied to specific behavioural qualities. Although the averaging model predicts that traits are averaged into an overall impression. Asch suggested that our knowledge about people is structured by our prior set of beliefs about which personality traits go together. In forming impressions of others, we attempt to determine what characteristics in each person explain their

behaviour and cause them to act the way they do. Edward Jones and Keith Davis (1965) were particularly interested in how people infer the cause of a single instance of behaviour. According to them, people try to infer from an overt action whether it correspond to a stable personal characteristic of the actor. Thus a correspondent inference is an inference that the action of a actor corresponds to, is indicative of, a stable personal characteristic. The theory of correspondent inferences describes bow people use certain rules of thumb in an attempt to infer dispositional (internal and stable) causes of behaviour. Hundreds of experiments have compared behaviour when individuals are lone and when other persons are present. The important generalisation from these studies is that social situations have unmistakable effects on behaviour, whether to the improvement or the detriment of performance. The effects are not confined to those social situations in which deliberate efforts are made to "influence people" (e.g., to change their attitudes). Social situations produce differential effects on our behaviour whether we are aware of the fact or not. Typically, the subject is presented with a verbal description of a person, or a cluster of trait labels ("intelligent, rigid, cold." etc.), or photographs of persons, or simply the names of social roles (occupational, sex role, age grades, etc.) and groups (ethnic, religious, political, etc.). Then he is asked to make ratings about the person, or to describe him further, or to tell a story about him. In other words, the term "person perception". Is something of a misnomer in terms of the typical research procedure. Most of the research clearly studies how we size-up people, how judges them, and how we evaluate them.

1.8 UNIT END QUESTIONS

1) According to Jones and Davi's what are the logical rules of correspondence theory?

2) Explain the central idea of Kalley's model.

3) Simple formula of social interaction is define as .....

1.9 SUGGESTED READINGS

Donn Byrne, Robert A. Baron, (2004), *Social Psychology*, Pearson Education, Inc, Tenth Edition. London.

Muzafer Sherif and Carolyn W. Sherif (1969), *Social Psychology,* Harper & Row, Publishers New York, Evanson.

Stephen L. Franzoi (1996), *Social Psychology*, Times Mirror Higher Education Group. Inc. Brown & Benchmark Publisher, London.

UNIT 2 INTENTION, ATTITUDES AND INTEREST: DEVELOPMENT AND MANAGEMENT

Structure

2.0 INTRODUCTION

This unit introduces deals with attitudes, intention and social interest. It gives a definition, description and characteristic features of attitude and differentiates the same from those of intention and social interest. The unit also describes the various factors which influence the attitudes, intention and social interest. The

unit provides theories of attitudes, intention and social interest. There are many social processes involved in the development the development and management of attitudes, intention and interest and these are given in detail in this unit. The unit also presents the behavioural changes that occur as a result of attitudes, intentions and interest.

2.1 OBJECTIVES

After reading this unit, you will be able to:

- Elucidate the concepts of attitude, intention and social interest;
- Define attitude, intention and interest;
- Describe the theoretical frameworks of attitude, intention and interest;
- Explain the social processes in development and management of attitude, intention and interest;
- Describe how individual attitude, intentions and interests lead to a change in social behaviour; and
- Identify the specific factors which influence attitudes, intentions and interests.

2.2 DEFINITION OF ATTITUDES, INTENTION AND INTEREST

The term attitude refers to certain regularities of an individual's feeling, thoughts, and predispositions to act toward some aspect of one's environment. Feelings are often referred to as the affective component, thoughts as the cognitive component, and predispositions to act as the behavioural component. One may hold attitudes toward concrete objects, such as Coca-Cola, or toward abstract entities, such as democratic government. Attitudes may pertain to remote, impersonal entities, such as foreign aid, or they may be extremely personal, such as feeling that one's nose is too big.

The three components may be illustrated by an individual's attitude toward Common Wealth Games (CWG):

1) The affective component of the attitude is his vigorous emotional feeling against Common Wealth Games. This component is inferred from the fact that his blood pressure rises when he reads of large appropriations for this purpose, or when he encounters someone who stoutly defends Common Wealth Games, or it is inferred from the individual's angry behaviour whenever he talks about it.

2) The cognitive component of his attitude consists of impoverishment of Indian economy due to huge money being spent on these games rather than uplifting the poor, that the money is mainly siphoned off in the form of graft to officials of the Indian and foreign government, and that his country will receive nothing in return.

3) The behavioural component consists of action tendencies. These are inferred from what the individual plans to do, or says will do or what the individual actually does. The person with such an attitude will write to the government and the party in power how very wrong this kind of organising games in

which huge money is spent. The person asks the veters to vote gainst the government as well as when the bill for CWG comes in the parliament. Another behaviour could be the person denounces CWG in conversations with friends and associates, and he reads articles written by persons who are against CWG.

An attitude is usually thought of as a hypothetical construct, not directly open to observation but inferred from verbal expressions or overt behaviours. A hypothetical construct is "an entity or process that is inferred as actually existing…." Attitude belongs to that category of measurements where, from a limited set of observations one can make inferences about attitude which in turn gives rise to predictions about behaviour that has not been measured. For example, from a set of statements that a person makes about a particular community , we may infer that the person has a strong negative attitude toward them. From this measure of attitude and from hypotheses about the effect of attitudes on the ability to make cognitive discriminations, it would be possible to predict that if a list of people's name is given to the person, he would be able to discriminate that name from the names not belonging to that particular community.

Attitudes are considered to be functional, in that they may be emotionally satisfying to the concerned individual. For example, an individual with considerable hostility may find an outlet for expressing the hostility in prejudiced attitudes toward people of certain community or group. The person may find support from other like minded persons and thus is enabled to express hostility with social approval.

Attitudes may also be used to justify particular behaviours. For example, one may have prejudice towards a certain minority group. Let us say the person is a businessman who needs cheap labour for some work. He would have employed persons from this community and also pay low wages and would explain such a low wage in terms of the members belonging to a minority group and that they do not deserve more than the same. Some attitudes, however, are functional only in the limited sense that the individual may gain some satisfaction in holding attitudes similar to those of his neighbors and friends.

Self Assessment Questions

1) Define attitude

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2) What are the characteristic features of attitude?

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3) Discuss how attitudes are used to justify certain beahviours.

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4) Discuss attitude as a hypotheticial construct.

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2.3 THEORIES OF ATTITUDE ORGANISATION

The years since World War II have seen the gradual development of theory appropriate to the study of attitude change. While none of the theories developed is as yet adequate, they nevertheless serve to integrate many investigations that formerly appeared to be unrelated. Most of the theories are intrapersonal in that they pertain to the relations of the three attitude components within an individual. They specify various conditions that control these relations and produce changes in them.

2.3.1 Consistency as an Organising Principle

One of the prevailing characteristics of human thought and behaviour is its tendency to be consistent. If we like a person, we tend to attribute "good" traits to him, and generally also resist any suggestion from others that the person concerned might possess undesirable traits. We also have beliefs that that go in line with our attitude. Also we behave in accordance with our belief system. In an experiment where a large number of advertisements were given linking smoking with cancer, the persons were asked whether or not they believed in the relationship between smoking and cancer. Only 7 percent of the heavy smokers believed that it had, compared with 20 percent of the light smokers and 29 percent of the nonsmokers (Osgood, 1960).

There is a high degree of consistency in human thought, feelings and behaviour. In 1945 Lecky mentioned about a single principle in this regard, viz., the tendency of the individual to be self-consistent. He suggested that this single principle might substitute for the many principles of human behaviour that had been developed for dealing with diverse areas of cognition and behaviour. He attempted to show how learning could be explained as well by a consistency principle as by conditioning. The he also explained the process of forgetting through the consistency principle. He pointed out in this regard that the inconsistent elements dropout of memory. He even developed a theory of pleasure, based upon the idea that pleasure is experienced when the organism finds a way to make consistent some experience which is at first inconsistent.

Perhaps the father of modern consistency theory is Heider, who published and important paper on the topic in 1946 and in 1958 published a book-length monograph devoted to his "balance theory." In Just the last decade, widespread interest in the principle of consistency has been evident. Many behavioural scientists are now assiduously devoting themselves to developing systematic theories based upon the principle, and many active research programs are in progress.

2.3.2 Heider's Balance Theory of Attitude Organisation

Heider (1946, 1958)'s theory of balance states that a positive or negative affect toward another person tends to be in a state of balance if the individual's affect toward an attitude object is similar to that of the other person. A state of balance is achieved when the three signs of the relations are all positive or when two are negative. Balance and imbalance are related to cognitive structure, affect, person perception, influence, and attitude-change processes.

This theory of Heider was elaborated upon by Cartwright and Harary in 1956. . A formalisation and elaboration of Heider's theory in terms of the mathematical theory of linear graphs was propounded by them and their elaboration takes into account more than three elements.

Also an extention to Heuider's theory was put forward by Rosenberg and Abelson (1960). This provided for positively and negatively signed elements as well as positively and negatively signed relation, which took into account more than three elements. This theory is very similar to Cartwright and Harary's system, but is expressed in terms of matrix theory.

2.3.3 Newcomb's Theory of Symmetry

Newcomb put forward this theory in interpersonal communication. He stated that a person's attitude toward an object may be positive or negative. These relations may also vary in intensity. Symmetry between two persons exists when signs of attraction are alike and signs of attitude are alike, and intensities are equal. Dissimilar but complementary relations of two persons toward an object may also be symmetrical. A variety of group processes are treated in terms of the theory.

2.3.4 Osgood and Tannenbaum 's Theory of Congruity

Cognitive elements have positive, negative, or zero valence of varying intensity. Elements relevant to each other may also be positively or negatively related. Congruity exists when signs are all zero, or two are negative, and intensities are equal. Cognitive structures and attitude change are treated in terms of the theory.

2.3.5 Festinger Theory of Cognitive Dissonance

Two cognitive elements are said to be in dissonance with respect to each other if the obverse of one element follows from the other. The existence of dissonance gives rise to pressures to reduce it. Processes of dissonance reduction are related to cognitive or behavioural changes.

2.3.6 McGuire's Two-Process Theory of Consistency

McGuire put forward cognitive preservation and cognitive growth motives and pointed out that cognitive preservation motives are of 4 categories, viz., need for

consistency, attribution, categorising, and objectification. He also divided the cognitive growth motives into need for autonomy, stimulation, teleology, and utilitarian. Similarly he also subdivided the affective preservation motives into need for tension, expression, ego defence, and need for reinforcement And divided the affective growth motives into need for assertion, affiliation, identification and modeling. When these needs are fulfilled there is consistency. For example, wishful thinking should be consistent with the desirability. Similarly logical thinking should be consistent with the beliefs one has and should be in line with the rules of formal logic.

2.3.7 Katz and Statland's Theory of Attitude Change

This is based upon four motivational bases for attitude. These are: (i) the adjustive function, (ii) the ego-defensive function, (iii) the value-expressive function, and (iv) the knowledge function. Only the value-expressive function and the knowledge function make direct use of a consistency principle.

2.3.8 Kelman Three Process Theory of Attitude Change

This theory was put forward in 1961. According to this theory, compliance occurs as a result of reward or punishment by the influence agent. Identification occurs through formation of a satisfying relation to the influence agent. The internalisation occurs when the change is congruent with one's values. Only internalisation makes use of the consistency principle.

2.3.9 Rosenberg's Theory of Affective Cognitive Consistency

Rosenberg's theory is not as broad as some of those listed above and is also not very extensive. It however contributes to a better understanding of the nature of affective-cognitive components and the relation between them. Rosenberg has concerned himself primarily with conceptualising what happens within the individual when attitudes change. He is particularly interested in the relation between affective and cognitive components of an attitude. In general, past treatments have recognised both of these components, but have been unconcerned with specifying in any precise way how they are organised with respect to each other. Rosenberg attempts to remedy this deficiency. In addition, he extends the cognitive component of an attitude to include not only cognitions about the attitude object, but also beliefs about the relations between that object and other important values of the person.

The affective component is defined by Rosenberg as the positive or negative feeling that the individual has toward the attitude object. Thus, a person may have a negative feeling toward Republican congressthe Bharatiya Janata Party. That person also has certain beliefs about them that relate to other positively or negative valued conditions. The person might believe that this party members obstruct progress, that they hamper the economy, that they have outmoded views of development, etc. Rosenberg's principal hypothesis is that the nature and strength of the feeing toward and attitude object are correlated with the cognitions associated with the attitude object. Strong and stable positive affect toward a given object should be associated with beliefs that it leads to the attainment of a number of important values, while strong negative affect should be associated with beliefs that relate the attitude object either to less important values.

Rosenberg in 1953 has developed a procedure for determining the cognitive components of attitudes. He uses a set of thirty-five value statements, such as "all human beings having equal rights." "People being well-educated," "making one's own decisions," and "attaining economic security." The subject first categorises each item in terms of its value importance, that is, how satisfying it is to him. To do this, he considers each value statements separately and rates its value importance by placing it in a category ranging from "gives me maximum satisfaction" (+ 10) through "gives me neither satisfaction nor dissatisfaction" (0) to "gives me maximum dissatisfaction" (-10). For example, if he values education highly, he might give a rating of +8 to "people being well-educated."

Second, the subject rates these value statements with respect to how well a particular attitude contributes to their realisation. Suppose, for example, that the attitude concerns CWG about which mention was made in the beginning of this unit,. Taking the first value statement, "people being well-educated or poverty being reduced", the person would rate money being spent on CWG on a scale from +5 to -5. Positive ratings would imply that money spent on CWG contributes to the attainment of the value "people being well-educated or poverty beign eradicated, ," and negative rating would imply that money spent on CWG will interfere with people getting educated or poverty being reduced etc.

From ratings of value importance and perceived instrumentality, a cognitive index for the attitude object Budget spent on CWG could be obtained. This index represents that subject's pattern of beliefs about the extent to which money spent on CWG results in the attainment of or interference with the individual's values. Weighted according to their importance, it is a quantitative measure of the extent to which a person's attitude is consistent with his values.

"The index is obtained by algebraically summing the importance-instrumentality products for each of the values. Thus, if "people being well-educated" is ranked 9 in importance, and money spent on CWG receives an instrumental rating of 4, the product of these is 9 × 4, or, 36. Similar products are obtained for each of the other thirty-four value statements as they pertain to Money spent on CWG and are summed to obtain a cognitive index for the attitude object.

Structure is consistent with the affect of an attitude, as measured by an attitude scale. That is, if a subject has strong positive affect toward an attitude object, he is likely to have a high cognitive index for that attitude, believing it to be instrumental in attaining the individual's positive values and in blocking negative values. The association between the affective component of an attitude and the cognitive index has been found to be greatest for the person's most salient values. A person's attitudes, then, re anchored in the important values in highly consistent manner.

Of particular importance are the implication of Rosenberg's theory and methodology for understanding attitude change. A basic proposition in his theory is that when the affective and cognitive components of an attitude are mutually consistent the attitude is in a stable state. When the affective and cognitive components are mutually inconsistent (to a degree that exceeds the individual's present tolerance for such inconsistency) the attitude is in an unstable state and will undergo spontaneous reorganising activity until such activity results in either (1) the attainment of affective-cognitive consistency or (2) the placing of an "irreconcilable" inconsistency beyond the range of active awareness.

From this proposition it follows that if certain external forces bring about a change in either the affective or cognitive components of a previously stable attitude, pressures will arise to change the remaining component. While most attitude studies have stressed change in cognitive components as a cause of shifts in affective components, Rosenberg has concentrated on demonstrating that a change in affect will produce cognitive changes.

Self Assessment Questions

1) Discuss consistency as an organising principle.

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2) Describe the Balance theory of Heider.

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3) Put forward the theories of Newcomb and Osgood.

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4) How is Festinger theory different from Rosenberg's theory.

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2.4 FESTINGER'S THEORY OF COGNITIVE DISSONANCE

Festinger introduces his theory by noting that the attitudes of an individual are normally consistent with each other, that he behaves in accordance with his attitudes, and that his various actions are consistent with each other. For example,

if a person believes in democracy, he does not believe in communism. If he believes a college education is a good thing, he tries to send his children to college. Of particular interest is the question of what happens when inconsistencies occur.

The term dissonance is introduced to represent an inconsistency between two or more cognitive elements. Two cognitive elements are in a dissonant relation if, considering these two alone, the obverse of one element would follow from the other.

For example, if a person knew that the most he could afford to pay for a new motor bike was Rs. 35000/- and that he had just been persuaded to sign a contract to purchase one costing Rs. 50000/- , there would be a dissonant relation between these two cognitive elements. On the other hand, two cognitive elements are consonant with one another if one follows from the other. Thus, knowledge that the person is getting wet is consonant with the knowledge that it is raining.

Relations between cognitive elements may be either relevant or irrelevant. Dissonance and consonance may only exist between relevant elements. Many cognitive elements have nothing to do with each other. A person may know that the cost of a coca cola is Rs. 8/- and may also know that petrol is required for a car to run. These elements are irrelevant to each other. The magnitude of dissonance is a function of the proportion of all relevant cognitive elements that is dissonant. These elements are generally weighted according to their importance. Thus, the magnitude of dissonance may be expressed in terms of the following ratio:

Dissonance = The number of dissonant elements / the total number of consonant elements × 100

From this above ratio it is clear that the more nearly equal the relative proportions of consonant and dissonant elements, the greater the dissonance is. If there are only a few dissonant elements and many consonant elements, dissonance is relatively low. The number of dissonant elements can never exceed the number of consonant elements, for this would lead to a change, removing the dissonance. Hence the maximum value that dissonance can reach is 1, which is approached when the proportions of dissonant and consonant elements are equal.

Dissonance when high can be reduced by the following methods:

1) *Change of a behavioural cognitive element*

When knowledge of one's own behaviours is dissonant with a belief, it is often simplest to change one's behaviour. For instance if a person smokes but thinks it is bad for his health, he may stop smoking. Or if he realises that "skipping the classes to go to a matinee show" instead of studying is inconsistent with knowledge that he intends to apply for medical school, he may stop going to matinee shows.

2) *Change of an environmental cognitive element*

Sometimes the behaviour of a person is dissonant with some environmental factor that can be changed. For example, the person who smokes, may reduce the dissonance between his knowledge that smoking causes cancer and the use of

cigarettes by changing to a filter-tip brand. Perhaps, the easiest aspect of the environment to change is the social or interpersonal environment. Thus a smoker bothered by dissonance may seek support from other persons who also smoke and who can present arguments and reassurance against the view that lung cancer is caused by smoking. He may, for example, point to the fact that many doctors smoke.

3) *Addition of new cognitive elements*

Sometimes it is difficult to change any of the cognitive elements that are involved in dissonance. Under these circumstances it is often possible to add new elements to outweigh the dissonant ones. A person who has purchased a bike that he cannot afford, may convince self that there is likelihood of increase in the pay packet, can readily borrow the additional money, or that has probably overestimated the expenses and underestimated the income.

2.5 FORMATION OF ATTITUDES AND FACTORS IN ATTITUDE CHANGE

2.5.1 Factors in Formation of Attitudes

Attitudes are formed by many factors as given below:

1) **Direct Instruction:** This involves being told by parents, schools, community organisations, religious doctrine, friends, as to what attitudes to hold etc.

2) **Operant Conditioning:** This is a simple form of learning, based on the "Law of Effect" For instance behaviours including verbal behaviours and even thoughts tend to be repeated if they are reinforced. Conversely, behaviours tend to be stopped when they are punished. Thus, if one expresses, or acts out an attitude toward some group, and this is reinforced by one's peers, the attitude is strengthened and is likely to be expressed again. The reinforcement can be as subtle as a smile or as obvious as a raise in salary. Operant conditioning is especially involved with the behavioural component of attitudes.

3) **Classical conditioning:** This is another simple form of learning. In this a natural response (salivating) to a natural stimuli (Food) is paired or associated with a neutral stimuli(bell) and repeated many times. The organism starts associating the neutral stimuli(bell) with the natural stimuli (Food) and gives the natural response(salivating)nm to the neutral stimuli. That is the neutral stimulus (bell) has acquired the ability to elicit the natural response (salivating) (which normally occurs only to the natural stimulus). At this point the stimulus is no longer neutral and so is referred to as a conditioned stimulus (CS) and the response has now become a learned response and so is referred to as a conditioned response (CR). In Pavlov's research the UCS was meat powder which led to an UCR of salivation. The Neutral Stimulus was a bell. At first the bell elicited no response from the dog, but eventually the bell alone caused the dog to salivate. In our real life daily situations, advertisers create positive attitudes towards their products by presenting attractive models in their ads. In this case the model is the UCS and our reaction to him, or her, is an automatic positive response. The product is the original NS which through pairing comes to elicit a positive conditioned

response. In a similar fashion, pleasant or unpleasant experiences with members of a particular group could lead to positive or negative attitudes toward that group. Classical conditioning is especially involved with the emotional, or affective, component of attitudes.

4) **Social (Observational) Learning:** This is based on modeling. We observe others showing a certain attitude towards certain group or persons belonging to a community etc. As we observe others getting also admired for their attitude we too follow them and develop those attitudes. Thus attitudes are formed through modeling.

5) **Cognitive Dissonance:** This comes about when related cognitions, feelings or behaviours are inconsistent or contradictory. Cognitive dissonance creates an unpleasant state of tension that motivates people to reduce their dissonance by changing their cognitions, feeling, or behaviours. For example, a person who starts out with a negative attitude toward taking drugs, will experience cognitive dissonance if the drug makes them feel pleasant and great and they find themselves enjoying the drug experience. The dissonance they experience is thus likely to motivate them to either change their attitude toward drug taking or stop taking drugs. This process can be conscious, but often occurs without conscious awareness.

6) **Unconscious Motivation:** Some attitudes are held because they serve some unconscious function for an individual. For example, a person who is threatened by his contracting HIV as he visits prostitutes may employ the defense mechanism of reaction formation and become a crusader against HIV. Or, someone who feels inferior may feel somewhat better by putting down a group other than their own. Because it is unconscious, the person will not be aware of the unconscious motivation at the time it is operative, but may become aware of it as some later point in time.

7) **Rational Analysis** involves the careful weighing of evidence for, and against, a particular attitude. For example, a person may carefully listen to the election campaigns and read opinions of political experts in order to decide which candidate to vote for in an election.

Thus attitudes are formed by a large number of factors. Now let us see how these attitudes could be changed.

2.5.2 Factors Causing Attitudinal Change

1) **Consistency:** An inconsistent attitudinal system, which is unstable is easily changeable than consistent attitudinal system, which is restively stable.

2) **Interconnectedness:** Interconnected attitude are resistant to incongruent change.

3) **Consonance of attitude cluster:** Dissonant attitude cluster is more susceptible to incongruent change than consonance attitudes are less prone to incongruent change.

4) **Strength and No. of Want Satisfaction:** Functionally Significant attitudes are less prone to incongruent change.

5) **Structure of attitude:** Less structural attitude system are easier to change than structural attitudes.

6) **Centrality of related values:** Attitude related to central values are difficult to more in an incongruent change.

Personality:

Intelligence

a) Less I.Q. persons are more easily influenced by propaganda and more confirming to group pressures.

b) Abnormal persons are less susceptible to change as they live in their own

c) Persons with high self esteem cannot be so easily susceptible to change of attitude as a persons with low self esteem.

Persuasibility:

a) Experts persuade more than non-experts.

b) Rapid speaking persons are more persuasive than slow speaking.

c) Females are more perusable than males.

Cognitive need and style: Cognitive need clarifiers are prone to incongruent change, while cognitive need simplifiers are prone to congruent change.

Aggressiveness: The more aggressive a person less susceptible to change of attitude.

Neuroticism: Higher the neuroticism the greater the change in attitude..

Extroversion– Introversion: Highly extroverted persons are more difficult to change their attitude as compared to introverted persons.

Manifest anxiety: Persons with high manifest anxiety are more susceptible to Attitude change.

Authoritarianism: Authoritarians are resistant to attitudinal change.

Suspiciousness: Highly Suspicious person are resistant to change of attitude.

Self Assessment Questions

1) Describe Festinger's theory of Cognitive Dissonance with suitable example.

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2) What are the factors that contribute to change in attitude?

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3) What factors contribute attitude formation?

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2.5.3 Characteristics of the Source of Communication and Attitude Change

There are many factors that are related to the source of communication to change. These include the credibility of the source, attractiveness of the source, familiarity, liking, power of the source, etc. Let us deal with each of these in some detail.

1) **Credibility of the source:** In the short run, credibility of the source bring immediate attitude change, but in the long run, frequency of message is more effective in attitude change (Sleeper effect)
2) **Attractiveness of the source:** Congruent change is directly proportional to the degree of attractiveness of the source.
3) **Familiarity:** More familiarity tends to attractiveness and affective in attitude change.
4) **Liking:** Liking and familiarity have invested U relationship.
5) **Power of the source:** Power of source is more affective in public commitment than private commitment.

2.5.4 Medium of Communication

1) **Mass Media:** Media such as radio, newspaper etc. are more prone to bring attitude change as compared to the television.
2) **Specialised channels:** Are more susceptible to bring attitude change.
3) **Face to face communication:** Most effect in personal influence

2.5.5 Form and Content of Communication

1) **Instrumental Value of Message:** will be more effective in attitude change.
2) **Amount of change advocated:** Foot in the door technique, larges the change advocated, the greater the change produced.
3) **Arguments:** Two-sided arguments are more effective for incongruent change, while one-sided arguments are effective for congruent change.
4) **Style of Communication:** Clear and skillful presentation, dynamic and persuasive style are more effective in attitude change.
5) **Conclusions:** Explicit conclusions are more prone to bring attitude change than implicit conclusions.
6) **Order of presentation:** Fear-fact sequence presentation of message is more effect in attitude change.
7) **Intensity of Fear:** Moderate amount of fear, bring effective attitudinal change.

2.5.6 Situational Factors

1) **Discussion:** Group discussion is more effective for incongruent change, while solitary listening is more effective for congruent change.
2) **Commitment:** Public commitment has great influence than private commitment.
3) **Decision:** Group decisions are more likely to bring attitude change rather self-decision.

2.5.7 Brainwashing

This is a technique used for changing the attitude of prisoner of war. The elements of brainwashing include the following:

1) Rigid environment,
2) Loss of identity,
3) Extreme emotional arousal
4) Guilt
5) Confession,
6) Reinforcement and religious conversion.

2.5.8 Group Affiliation

1) **Value of Membership:** (a) highly valued group norms are resistance to change (b) low valuation member change in the direction of speech, while high valuation member tend to change in opposite direction.
2) **Status of member:** High ranker live up to all group norms, while low or unsure ranker conform and over conform the group norms.
3) **Legitimacy of norm:** Is effective till these are improper intrusion into personal freedom.
4) **Circums lances of enforcement:** Intergroup contact enables to modify attitudes
5) **Role playing:** Member of group, if the role player rather observer, tend to become more congruent changes.

Self Assessment Questions

1) State the various characteristics of source of communication that are important for attitude change

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2) Discuss medium of communication and form and content of communication in regard to change of attitude.

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3) What situational factors contribute to change of attitude?

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4) Describe brain washing and group affiliation in terms of attitude change

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2.6 INTENTION

Very often, when a person says that he or she is going to do something, this refers to the person's intention.

We also sometimes speak of an action as intentional, and we may also ask with what intention the thing was done. In each case we employ a concept of 'intention' Now let us see what this intention is.

'Intention always concerns the future'. But an action can be intentional without being concerned with the future in any way.

There are various senses of 'intention'. To have the concept intention the activity should be associated with the word intention.

Where we are tempted to speak of 'different senses' of a word which is clearly not equivocal. The distinction between an expression of intention and a prediction is generally appealed to as something intuitively clear.

'I am going to be sick' is usually a prediction; 'I am going to take a walk' usually an expression of intention.

The distinction intended is intuitively clear, in the following sense: if I say 'I am going to fail in this exam.' And someone says 'Surely you aren't as bad at the

subject as that', I may make my meaning clear by explaining that I was expressing an intention.

Prediction is a statement about the future . This suggests that an expression of intention is not. It is perhaps the description—or expression—of a present state of mind, a state which has the properties that characterise it as an intention.

An intention is a disposition in the process of realisation. It is the active desire to achieve some future goal through some specific behaviour in a particular circumstance. For example, we perceive a man bent over fingering the laces on his shoe as if intending to tie them, a woman reaching for a car door as if intending to open it, or a student enrolled in college as if intending to get a degree. Perceived intentions organise our perspective; they give yet another kind of meaning to our understanding of the social world in terms of purposes, goals, aims, plans, designs, missions, and ends. Intentions are the active, conscious, future aims we perceive another to have.

2.6.1 Characteristics of Intentions

Intentions have three important characteristics:

1) The intended goal may involve imaginary elements

   For example "I intend to stop Arjun from cheating in class" does not imply that Arjun is really cheating. That description of reality entailed by an intention may be wrong.

2) One cannot substitute into the description apparently synonymous words or phrases.

   For example, from "The correspondent intends to interview the Lt. Governor of Delhi" and "the governor is the smartest politician in the state," we cannot infer that "John intends to interview the smartest politician in the state." Rather, he may regard the governor as a mediocre politician who got his position through luck and shrewd friends.

   In this we simply cannot know for sure what he intends, for his intention may involve totally imaginary elements unknown to us, or he may be trying to deceive us about his intentions through manipulating his field of expression.

3) To understand the other's intention necessitates that we adopt a congruent description of it.

   To say that the correspondent intends to interview the smartest politician in the State of Delhi, as a description, may seem absolutely consistent with the facts (his going to the governor's office with an appointment for an interview, having discussed with us his desire to write an article on the governor, and taking along a tape recorder; and our belief that the governor is Delhi's smartest politician).

   Yet, the correspondent may not agree that this is his intention, for he may deny that he is interviewing the smartest politician. To

4) Clearly intentions can really be known only to the person holding them.

   It is only by asking the person himself that we get a true picture of his intentions especially if the person tells the truth to us. And here our faith in

the correspondent's word, his credibility, is the crucial element in accepting these intentions.

5) Intentions are characteristically active. They are goals now in the process of realisation, dispositions now being transformed to manifestations. This means, then, that there are inactive goals, or dispositions not in the process of transformation.

2.6.2 Theories of Intention

The theory of Planned behaviour:

The theory of planned behaviour is a theory about the link between attitudes and intentions. It has a component perceived behavioural control. It covers volitional behaviours for predicting behavioural intention and actual behaviour. It was proposed by Icek Ajzen as an extension of the theory of reasoned action. It is one of the most predictive persuasion theories. It has been applied to studies of the relations among beliefs, attitudes, behavioural intentions and behaviours in various fields such as advertising, public relations, advertising campaigns and healthcare.

The theory of Reasoned Action

According to the Theory of Reasoned Action, if people evaluated the suggested behaviour as positive (attitude), and if they think their significant others wanted them to perform the behaviour (subjective norm), this results in a higher intention (motivation) and they are more likely to do so. A high correlation of attitudes and subjective norms to behavioural intention, and subsequently to behaviour has been confirmed in many studies.

A counter argument against the high relationship between behavioural intention and actual behaviour has also been proposed as results of some studies do not show that behavioural intention always leads to actual behaviour because of circumstantial limitations.

Self Efficacy Theory (SET)

Self efficacy was proposed by Bandura in 1977, which came from Social Cognitive theory. According to Bandura, expectations such as motivation, performance, and feelings of frustration associated with repeated failures determine affect and behavioural reactions. Expectations were taken up in two different types, viz., self efficacy and outcome expectancy.

Self efficacy means the ability and confidence to perform a behaviour. Previous investigations have shown that peoples' behaviour is strongly influenced by their confidence in their ability to perform that behaviour. As the Self Efficacy Theory contributes to explaining various relationships between beliefs, attitudes, intentions, and behaviour, the SET has been widely applied to health-related fields such as physical activity and mental health in preadolescents, and exercise.

2.6.3 Behavioural Beliefs and Attitude Toward Behaviour

Behavioural belief: This concept is based on the subjective probability that the behaviour will produce a given outcome.

Attitude toward behaviour: An individual's positive or negative evaluation of self-performance of the particular behaviour. The concept is the degree to which performance of the behaviour is positively or negatively valued. It is determined by the total set of accessible behavioural beliefs linking the behaviour to various outcomes and other attributes.

Normative belief: an individual's perception about the particular behaviour, which is influenced by the judgment of significant others (example, parents, spouse, friends, teachers).

Subjective norm: an individual's perception of social normative pressures, or relevant others' beliefs that he or she should or should not perform such behaviour.

Control beliefs and perceived behavioural control

Perceived behavioural control: an individual's perceived ease or difficulty of performing the particular behaviour. It is assumed that perceived behavioural control is determined by the total set of accessible control beliefs.

Control beliefs: an individual's beliefs about the presence of factors that may facilitate or impede performance of the behaviour. The concept of perceived behavioural control is conceptually related to self-efficacy.

Behavioural intention and behaviour

Behavioural intention: an indication of an individual's readiness to perform a given behaviour. It is assumed to be immediate antecedent of behaviour. It is based on attitude toward the behaviour, subjective norm, and perceived behavioural control, with each predictor weighted for its importance in relation to the behaviour and population of interest.

Behaviour: an individual's observable response in a given situation with respect to a given target. Ajzen said a behaviour is a function of compatible intentions and perceptions of behavioural control in that perceived behavioural control is expected to moderate the effect of intention on behaviour, such that a favorable intention produces the behaviour only when perceived behavioural control is strong.

The knowledge of the role of perceived behavioural control came from Bandura's concept of self-efficacy. In previous studies, the construction and the number of item inventory of perceived behavioural control have depended on each particular health topic. For example, for smoking topics, it is usually measured by items such as "I don't think I am addicted because I can really just not smoke and not crave for it," and "It would be really easy for me to quit."

2.6.4 Strengths and Weaknesses of Theories of Intention

Strengths

At first, theory of planned behaviour can cover people's volitional behaviour which cannot be explained by Theory of Reasoned Action.

An individual's behavioural intention cannot be the exclusive determinant of behaviour where an individual's control over the behaviour is incomplete.

By adding "perceived behavioural control," theory of planned behaviour can explain relationship between behavioural intention and actual behaviour.

Weaknesses

Theory of planned behaviour is based on cognitive processing and level of behaviour change. Compared to affective processing models, theory of planned behaviour overlooks emotion variables such as threat, fear, mood and negative or positive feeling and assessed them in a limited fashion.

In particular in the health related behaviour situation, given that most individuals' health behaviours are influenced by their personal emotion and affect-laden nature, this is a decisive drawback for predicting health-related behaviours.

Poor predictability for health-related behaviour in previous health research may be attributed to the exclusion of this variab

2.6.5 Application of Theory

These theories help to predict health-related behavioural intention. The theory of planned behaviour model is also a very powerful and predictive model for explaining human behaviour.

That is why the health and nutrition fields have been using this model often in their research studies.

In one study, utilising the theory of planned behaviour, the researchers determine obesity factors in overweight.

Chinese Americans (Liou, 2007). Intention to prevent becoming overweight was the key construct in the research process. It is important that nutrition educators provide the proper public policies in order to provide good tasting, low-cost, healthful food.

Self Assessment Questions

1) Define intention with suitable examples

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2) What are the characteristics of intention?

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3) Put forward the theories of intention

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4) What are behavioural beliefs and attitude? Explain.

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5) Discuss the strengths and weaknesses of theories of intention

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6) In what areas could we apply theories of intention?

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2.7 SOCIAL INFLUENCE

The concept of social influence has been assessed by social norm and normative belief in both the theory of reasoned action and theory of planned behaviour. Individuals' elaborative thoughts on subjective norms are perceptions on whether they are expected by their friends, family and the society to perform the recommended behaviour.

For instance, Social influence is measured by evaluation of various social groups. Taking the example of smoking issue:

1) subjective norms from peer group include thoughts such as, "Most of my friends smoke," or "I feel ashamed of smoking in front of a group of friends who don't smoke";

2) subjective norms from family include thoughts such as, "All my family smoke, and it seems natural to start smoking," or "My parents were really mad at me when I started smoking"; and

3) subjective norms from society or culture include thoughts such as, "Everyone is against smoking," and "We just assume everyone is a nonsmoker."

Human behaviour is guided by three kinds of consideration.

i) behavioural beliefs ii) normative beliefs iii) control beliefs.

In their respective aggregates, "behavioural beliefs" produce a favorable or unfavorable "attitude toward the behaviour"; "normative beliefs" result in "subjective norm"; and "control beliefs" gives rise to "perceived behavioural control."

In combination, "attitude toward the behaviour," "subjective norm," and "perceived behavioural control" lead to the formation of a "behavioural intention".

In particular, "perceived behavioural control" is presumed to not only affect actual behaviour directly, but also affect it indirectly through behavioural intention.

As a general rule, the more favorable the attitude toward behaviour and subjective norm, and the greater the perceived behavioural control, the stronger the person's intention to perform the behaviour in question should be. Finally, given a sufficient degree of actual control over the behaviour, people are expected to carry out their intentions when the opportunity arises.

Social Interest

One of Adler's key concepts is that of social interest. "Social interest" in German is "Gemeinschaftsgefuehl," which translates as "community feeling," as opposed to one's private interests or concerns. One's "style of life" is the set of construals and personal narratives one has devised in order to cope with being-in-the-world. If one has social interest then one evidences or enacts a "useful" style of life. If one does not have social interest then one is self-absorbed and is concerned only with one's self. Such a style of life is "useless."

Adler identifies the source of basic mistakes as an "inferiority complex," which is behaving "as if" one was of lesser stature (emotional, physical, intellectual) than others, and then creating a style of life based on this belief. The inferiority complex is more than just a cognition or an attitude. It is a form of self-centeredness and is self-defeating. If one solely pursues self-originated objectives then one tends to self-isolate and to avoid risk.

People have a self-concept, which is one's belief about who one is. People also have a self-ideal, which is a belief about how one should be. One experiences dissonance between these two ideations.

The greater the tension between them, the greater one's feelings of inferiority, because one is acting primarily to preserve one's concept of self.

Feelings of inferiority in turn lead to self-aggrandizement and the pursuit of a useless style of life. They result in the promotion of self-interest over social interest.

Social interest is more important than individual interest; put slightly differently, the best expression of individual interest is to veer towards social interest.

Only after recognising one's basic mistakes and taking prophylactic action to mitigate against them can one then segue to a useful style of life.

Undeveloped or underdeveloped social interest is evidenced by poor performance of basic life tasks. Reorienting oneself to pursue one's social interest in turn reorganises one's style of life and enables one to avoid committing further basic mistakes. In this way the goal of Adlerian therapy is to eradicate one's "inferiority complex" and to awaken ones undeveloped or underdeveloped social interest.

"Social interest" presents the following issues:

1) Social interest is an attitude or outlook towards furthering the welfare of others.
2) Evaluating one's style of life in terms of its "usefulness" is a form of utilitarianism.
3) Unless an individual is a person of influence it is unlikely her actions will result in an overall augmentation of social welfare or that they will implement or achieve any socially-desirable objective at all.
4) If one pursues social interest then one has a motive for doing so.
5) Social interest is a utopian ideal. It depends on a Marxist concept of society evolving to a utopian state of fraternity and brotherhood.
6) One's style of life comprises the set of one's "choices" and what one chooses in turn depends on one's style of life.
7) Adler believed community involvement, helping, and kindness are crucial to both individual and social health. He spoke of empathy, the ability to see from the other's viewpoint, to contribute through work and volunteerism, to cooperate in solving community problems, what role theory calls "taking the role of the other," etc.

2.8 LET US SUM UP

An attitude is learned mental readiness to react in a certain way toward on object of reference, that is a constellation of cognitive, affective and connective components, which are consistently related to each other but differ in their Valance (favorable or unfavorable) and multiplicity and exert directive influence on both social perceptions and behaviours through organisation and interpretation of diverse set of information, expression of central values and beliefs and enhancement of self-esteem. When we perceive another, we blend our perception of their manifestations, determinable, and dispositions—their field of expression—with perceived intentions. We impute to another some motive which organises our perception of their behaviour. Now, insofar as I use the term, an intention is a disposition in the process of realisation; it is the active desire to achieve some future goal through some specific behaviour in a particular circumstance. For example, we perceive a man bent over fingering the laces on his shoe as if intending to tie them, a women reaching for a car door as if intending to open it, or a student enrolled in college as if intending to get a degree. Perceived intentions organise our perspective; they give yet another kind of meaning to our

understanding of the social world in terms of purposes, goals, aims, plans, designs, missions, and ends. Intentions are the active, conscious, future aims we perceive another to have.

These intentions are projected towards us through another's field of expression. He presents a complex of phenomena bearing on our perspective and forcing recognition of specific, underlying, latent intentions. Thus, we see a field of expression that is a women opening a refrigerator door as a women intending to get some food. We may be wrong, of course. She may intend to check the inside temperature. Moreover, she may know we are watching and be deceiving us about her real intentions (say, to distract us from the game of chess we are playing against her). She may be framing a field of expression that conveys an intended intention, as does the actor on stage. Of course. But the percipient's perspective includes the other's field of expression only as a situation within the percipient's dynamic psychological field. Within this field, the perception becomes part of the percipient's cognitive balance and structure of beliefs and is related to his personality. Thus, the other's intentions are interpreted as a total historical and psychological act: as a gestalt whose elements are our past experience with him and similar others; our cultural meanings, values, and norms; our beliefs and personality; and our own intentions, including our super ordinate goal of self-esteem. Thus, the other may project his intentions, but their meaning for us involves their confrontation with our own experience and nature. This two-way process is basic to perception and I will later elaborate on it.

2.9 UNIT END QUESTIONS

1) Define attitude and discuss the various characteristic features of attitude.
2) What are the methods that we can use to change the attitude?
3) How are attitudes formed?
4) Discuss the theories of attitude formation and attitude change?
5) What are intentions? Describe intention a with suitable examples.
6) What is social Influence? How do these affect our behaviours ?

2.10 SUGGESTED READINGS

Donn Byrne, Robert A. Baron (2004), *Social Psychology*, Pearson Education, Inc, Tenth Edition. London

Davidson Donald (1957), G.E.M. Anscombe Press Paperback Edition, Oxford: Blackwell.

Rokeach, Milton. 1968, *Beliefs, Attitudes and Values*. San Francisco: Jossey Bass.

UNIT 3 SOCIAL DISTANCE : STATUS DISTANCE, BEHAVIOURAL DISTANCE, THE SOCIO CULTURAL FIELD, SPACE AND FORCE

Structure

3.0 INTRODUCTION

Social distance refers to people distant with regard to social relations. It is often implied that it is measured from the dominant city élite. The social periphery of a city is often located in the centre. Locational periphery in contrast is used to describe places physically distant from the heart of the city. These places often include suburbs and are socially close to the core of the city. In some cases the locational periphery may overlap with the social periphery. In this unit we will be dealing with the concept of social distancing, the types of social distance, causes of social distance, status components, status disequilibrium etc.

3.1 OBJECTIVES

After reading this unit, you will be able to:

- Define social distance;
- Describe the concept of social distancing;
- Differentiate between status distance and behavioural distance;
- Describe how to measure social distance through Bogardus Social Distance Scale;
- Explain social learning theory; and
- Analyse sociocultural field space and forces through Lewin's Field Theory.

3.2 CONCEPT OF SOCIAL DISTANCE

Robert E. Park first defined the term and concept of "social distance" as, "the grades and degrees of understanding and intimacy which characterise personal and social relations generally". Social distance describes the distance between different groups of society and is opposed to locational distance. The notion includes all differences such as social class, race/ethnicity or sexuality, but also the fact that the different groups do not mix. In the sociological literature, the concept of social distance is conceptualised in several different ways.

Social distance scale

Dr. Emory S. Bogardus, professor at the University of Southern California, developed the first scale widely accepted as a reliable indicator of social distance. Bogardus' scale was scrutinised by 100 academia, who rated sixty statements that expressed social distance. The judges ranked each statement on a scale from one to seven, one being the least social distance, and seven being the most social distance. Scores for each statement were added, and the arithmetic mean of each statement was recorded. The statement receiving a mean closest to one was judged to express the least social distance. The statement with the mean closest to the value of two was judged to express the next level of social distance, and so on.

3.3 TYPES OF SOCIAL DISTANCE

There are many types of social distance and some are given below: (i) Affective social distance (ii) Normative social distance (iii) Interactive social distance. Let us take up each of these one by one.

Affective social distance

This indicates how much social distance is associated with affective distance, that is, how much sympathy each member feels for the other members of the group. Emory Bogardus, the creator of "Bogardus social distance scale" was typically basing his scale on this subjective-affective conception of social distance. In studies concerning social distance, the center of attention is on the feeling reactions of persons toward other persons and toward groups of people.

Normative social distance

This refers to the widely accepted and often consciously expressed norms about who should be considered as an "insider" of the group and who should be considered as outsider of the group. Such norms indicate the distinction between ourselves and others. In this respect, normative social distance is very different from affective social distance, because here social distance is conceived as a non-subjective, structural aspect of social relations.

Interactive social distance

A third conceptualisation of social distance focuses on the frequency and intensity of interactions between two groups. The main idea here is that the more the members of two groups interact, closer they are socially. This conception is similar to the approaches in sociological network theory, where the frequency of interaction between two parties is used as a measure of the "strength" of the social tie between them.

It is possible to view these different conceptions as "dimensions" of social distance. However, it is important to note that these dimensions do not necessarily overlap. The members of two groups might interact with each other quite frequently, but this does not always mean that they will feel "close" to each other or that normatively they will consider each other as members of the same group. In other words, interactive, normative and affective dimensions of social distance might not be linearly associated.

3.4 BOGARDUS SOCIAL DISTANCE SCALE

The Bogardus Social Distance Scale is a psychological testing scale created by Emory S. Bogardus to empirically measure people's willingness to participate in social contacts of varying degrees of closeness with members of diverse social groups, such as other racial and ethnic groups, sex offenders, and homosexuals.

The scale asks people the extent to which they would be accepting of each group (a score of 1.00 for a group is taken to indicate no social distance):

- As close relatives by marriage (score 1.00)
- As my close personal friends (2.00)
- As neighbours on the same street (3.00)
- As co-workers in the same occupation (4.00)
- As citizens in my country (5.00)
- As only visitors in my country (6.00)
- Would exclude from my country (7.00)

The Bogardus Social Distance Scale is a cumulative scale (a Guttman scale), because agreement with any item implies agreement with all preceding items. The scale has been criticized as too simple because the social interactions and attitudes in close familial or friendship-type relationships may be qualitatively different from social interactions with and attitudes toward relationships with far-away contacts such as citizens or visitors in one's country.

For Bogardus, social distance is a function of affective distance between the members of two groups, even though which are equally important.

We like to keep our distance from others and there are very specific social rules about how close we can go to others in particular situations. This social distance is also known as body space and comfort zone and the use of this space is called proxemics.

Regulating the distances between us and other people provides us with several benefits, including safety and communication. When people are closer, it is easier to communicate with them. Thus there could be greater affection amongst members of a groups who are closer to each other. Opposite of this is that one may deliberately threaten a person by invading their body and space.

The social distances are approximate, and will vary with people, but they are still a good general rule. Hall (1966) identified four zones that are common in regard to social distance and these are: (i) public zone, (ii) social zone (iii) personal zone and (iv) intimate zone. Let us consider these in detail:

Public Zone: 12 feet (3m)

The public zone is generally over 12 feet. That is, when we are walking around town, we will try to keep at least 12 feet between us and other people. For example, we will leave that space between us and the people walking in front.

Of course there are many times when we cannot do this. What the theory of social distance tells us is that we will start to notice other people who are within this radius. The closer they get, the more we become aware and ready ourselves for appropriate action.

When we are distant from another person, we feel a degree of safety from them. A person at a distance cannot attack us suddenly. If they do seem to threaten, we will have time to dodge, run or prepare for battle.

Social Zone: 4 - 12 feet (1.5m - 3m)

Within the social zone, we start to feel a connection with other people. When they are closer, then we can talk with them without having to shout, but still keep them at a safe distance.

This is a comfortable distance for people who are standing in a group but maybe not talking directly with one another. People sitting in chairs or gathered in a room will tend to like this distance.

Personal Zone: 1.5 to 4 feet (0.5m - 1.5m)

In the personal zone, the conversation gets more direct, and this is a good distance for two people who are talking in earnest about something.

Intimate Zone < 1.5 feet (< 0.5m)

When a person is within arm's reach or closer, then we can touch them in intimate ways. We can also see more detail of their body language and look them in the eyes. When they are closer, they also blot out other people so all we can see is them (and vice versa). Romance of all kinds happens in this space.

Entering the intimate zone of somebody else can be very threatening. This is sometimes done as a deliberate ploy to give a non-verbal signal that they are powerful enough to invade your territory at will.

Varying Rules

The rules about social distance vary with different groups of people. You can detect this by watching people's reactions.

If you feel safe and they seem not to feel safe, back off.

If they invade your space, decide whether to invade back or act otherwise.

Turning sideways is an easy alternative for this, as a person to the side is less threatening than a person at the same distance in front of you.

Town and Country

People who live in towns spend more time close to one another and so their social distances may compact somewhat. In a large and crowded city, the distances will be less than in a small town. People who normally live a long way from

others will expand their social distances and may even have to lean over towards another person to shake hands and then back off to a safe distance.

Different countries also have different rules about social distances. The overcrowded nature of some Asian countries means that they are accustomed to talking to others from a very close distance. Watch a Japanese person talking at a party with a person from the Western countryside. The Japanese will step in and the Westerner will step back.

Studies on social distance in other countries have demonstrated that in the US prejudice is far klesser than in other countries.

Also social distance tends to be a function of worldly events.

In a study conducted in Texas concluded that minorities place more social distance between themselves and other minorities, than between themselves and whites. This study claimed that minorities might possibly model their behaviour after the members of the majority, since the majority constitutes a powerful model in our society. Prejudice seems to be one of the behaviours that might be modeled. This same study also found that social distance decreased as educational level increased, particularly among minority groups. Similar results had been noted in a study at Syracuse University.

Self Assessment Questions

1) Define Status. What are all the factors that determine the status of a person?

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2) Define social distance and describe the important characteristic freatures.

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3) What are the various types of social distance? How are these determined?

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4) What does Bogardus Social Distance Scale measure? Indicate the measurements of this scale.

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3.5 RANK AND BEHAVIOUR

Status is important for understanding social behaviour. It has been found that (i) lower status people tend to direct more status-related behaviour towards higher status persons and (ii) the higher a person's rank, the more likely he is to have status-oriented behaviour. To cite an example, if conflict were a status-behaviour, the higher status person would tend to have more conflict. Since the current order supports and permits their attainments, it is to be maintained. Those who derive privileges from a given system of allocation of status, wealth, and power will perceive an attack upon these prerogatives as an attack against the system itself.

The above point is also implied by Zetterberg's (1966) Theorem of the Preservation of the Reward System. According to this theorem, (1) those whose evaluative score is above the anchorage point of a scale of evaluation tend to resist any movement of the anchorage point closer to their evaluative score. They will also resist any inflation in the size of the unit of evaluation. (2) Those whose evaluative score falls below the anchorage point tend to resist any movement of the anchorage point away from their evaluative score. They will also resist any deflation in the size of the evaluative unit.

The implies that those having high ranks also are likely to have much interaction and cooperation (both support the status quo).

Suppose we define a high status as an alpha (A), the middle status a mue (M), and the low status the omega (Ω)

Then if person high on two statuses (an AA) supports the status quo, who is that attacks the prevailing order?

Theory and evidence suggest that such attacks will come not from the ΩΩstatuses initially, but from the Disequilibrated statuses—the AΩ and ΩA.

They provide the leadership, the political formulas, and organisation for opposition to the ruling class.

The ΩΩ statuses are "educated" and led by the Disequilibrated in attempts to change the status quo.

By virtue of the support that higher-ranking people give to the status quo and their greater interaction, the higher the rank of two people, the more they tend towards solidarity.

The status elite share similar interests, join the same economic, political, and social organisations, interact and cooperate more, and therefore develop solitary bonds.

Those at the top are enmeshed in intersecting activities and relationships.

3.6 STATUS DISEQUILIBRIUM AND BEHAVIOUR

The rank of two people only reflects one aspect of their relative status. The rank of two people is surely important in understanding their behaviour. But so is their relative status disequilibrium.

For example, let us say that a person needs self-assertion that includes success, recognition, being looked up to, and so on. This need is actualised through (i) an emphasis on one's dominant status and (ii) on the other's subordinate status in interaction.

A person with AΩ statuses, for example, will emphasise his A when interacting with others, while de-emphasising his Ω status.

This is reasonable, since high status is esteemed and people desire to raise their status positions relative to others. As a result of this disposition status disequilibrium causes cognitive dissonance.

Consider the plight of the person with unbalanced statuses. He emphasises his dominant status in interaction, while others accentuate his low status. There is thus an imbalance between his social behaviour, the behaviour he receives, and the behaviour he feels he should receive. This, as cognitive dissonance implies, produces a strain, that is frustration which can be relieved only by eliminating the dissonance. But how is this to be done?

That status disequilibrium produces stress for the individual and this results in stress reducing behaviour.

Empirical studies, however, do not consistently support this view that that imbalanced ranks generate strain and efforts to restore balance. Contradictory results have been obtained within the context of the dynamic psychological field, the reason for this empirical difficulty can be clarified. But to do this, the nature of this dissonance must be made explicit. Balance theory, as generalised by Cartwright, Norman and Harary (1965), provides a useful model of what is meant, by dissonance. Let i be an actor with status disequilibrium, j another person, and s, a status of i.

The relationship between these two is balanced if: their relationship and that of each to another object or individual is positive; or, there is one positive relationship and two negative ones. To apply Balance Theory.

Consider i's status as the object to which i and j relate, and let their behaviour be positive (solidary).

Then we have the unbalanced situations Figure below:

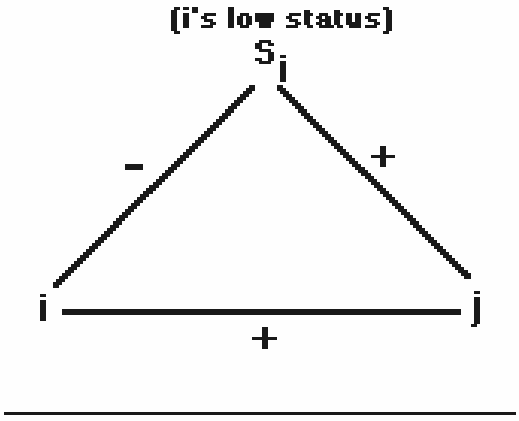

Fig. a

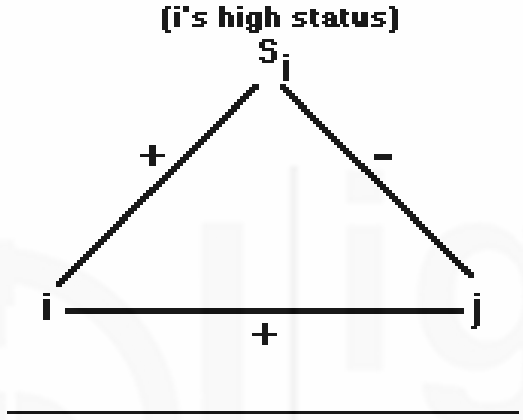

Fig. b

The above figure shows for i's high or low status. In the figure above

1) i's evaluation of his low status is shown by the negative valued line between i and s_i;
2) j's emphasis on i's low status is shown by the positive valued line between j and s_i;
3) positive interaction between i and j is indicated by the positive valued line connecting i and j.

Since there are two positive relationships and one negative, the situation is unbalanced and cognitive dissonance results. In the figure above, i has a positive evaluation and j a negative one of i's high status, while the relationship between i and j is positive.

Here also i suffers from cognitive dissonance. This motivates i to balance his behaviour and status. How can he do this? Clearly, he can alter his behaviour, for example, become antagonistic, and thereby eliminate the dissonance.

And it is this frustration-aggression resolution which sociologists would predict. However, there are also psychological mechanisms involved which make this outcome less predictable.

For one thing, the dissonance creates forces in i's psychological field which may alter his perception of the other's behaviour. The other may simply not be

perceived as emphasising i's low status, as may be the case if j is also perceived as very important to gratifying some of i's other needs (j may be i's wife), or if i initially believes that j thinks very highly of him.

Thus, dissonance is eliminated through misperception, which is a common phenomenon. We man also tolerate dissonance and control it through our integrated self.

Our movement towards our superordinate goal, around which we integrate our motivations, temperaments, and so on, may not be consistent with altering our behaviour to eliminate dissonance. For example, a student working towards his Ph.D.—his superordinate goal—may find himself dissonant regarding an important professor in his discipline. Change towards antagonistic behaviour to right his dissonance would be unwise, to say the least, since the professor may influence others to prevent his getting the Ph.D.

It is also possible that the student may have a strong ego, and a realistic contact with social reality. In this situation, he could well tolerate the dissonance until he gets his degree.

As a result of these mechanisms, the dynamics of misperception and the dissonance of a super ordinate goal, no overt behaviour may result from status dissonance. Nonetheless, one can presume that there is a tendency to alter behaviour.

Status dissonance is only one step in relating disequilibrium to behaviour.

The second is to note that common statuses between people provide them with similar interests and a communication bridge. This means that those sharing statuses have a common basis of discourse and understanding.

Moreover, those sharing a status have a common interest regarding those not sharing it.

Preserving or improving the common status provides a platform upon which those sharing the status can unite.

The more two people are status-incongruent the more their relationships are uncertain and secondly the more incongruent their expectations of each other's behaviour. Clearly, status is linked to expectations, and indeed some have defined expectations as part of status. This in conjunction with our tendency to emphasise our dominant status and the subordinate status of another implies that status disequilibrium leads to uncertainty. Each person has expectations about the social behaviour of others which enable prediction. The better the predictions, the better expectations conform to behaviour, the less the uncertainty. Therefore, social uncertainty is partially caused by status differences.

Status-congruence operates in this way. If i and j are status-congruent, as when both have ΩA statuses, then their common Ω and A statuses are positive links. These links facilitate communication between i and j through their common interests and serve as a bridge across which they cooperate with each other.

Moreover, a common status means that they will share a similar status oriented social perspective, as towards the political status quo. If i has ΩA (or AΩ) statuses

while j has AΩ (or ΩA), however, then not only is there dissonance within i and j and incongruence in their mutual expectations, but there are no status links to compensate for the incongruence.

Indeed, these differences in status mean i and j have different views, different interests, and different grounds for understanding. All these contribute to mutual uncertainty and incongruence in expectations. This incongruence in expectations results from i perceiving j consistent with j's lower status, while j emphasises his higher status behaviourally. Thus, a rich Delhiite may view another backward state member of parliament as a backward farmer and expect him to behave accordingly. The other, however, contrary to these expectations, may consistently emphasise his being member of parliament power in all social relations. The "expectancy congruence" is a dominant concept, which subsumes status congruence. It is generally argued that one learns from one's culture and experience what to expect from others and which beahviours are associated with the status.

Thus, to define a person as poor or powerless is to expect in particular situations behaviour aligned with those statuses. Status-incongruence between two people, means that they have a tendency to misperceive each other's status, and thus to have incorrect status-expectations.

One of the four cornerstones of the dynamic psychological field, linking social behaviour and status distances can be seen in the above. Let us now consider the various aspects of status and social behaviour.

i) The more similar in wealth, the more people are disposed towards mutual solidarity.

ii) Wealth is an achieved status and common achievement is a strong social bond.

iii) People who are similarly wealthy usually share education, occupation, or professional rank, ability, interests, ideologies, and so on.

iv) They have a common pride of achievement, a need and desire to interact, to exchange, to coordinate.

v) The poor cooperate with each other to pool resources against the wealthy, to overcome their status deprivations, and to coordinate their sociopolitical interests. Unions, consumer groups and boycotts, and populist movements manifest this.

A common power status, however, is not such a force for solidarity. Certainly, similar power status provides an interest and some basis for understanding and communication. However, the competitive nature of power weakens whatever support it gives for cooperation.

People who are similar in wealth can be cooperative and noncompetitive.

However a person of greater wealth, while having a status position one desires and thus perhaps the source of some envy, will not usually have control over others unless wealth also includes slaves.

Wealthy people can cooperate fully and without anxiety; powerful people also can cooperate, to be sure, but with prudence.

Moreover, unlike wealth, which usually can be acquired regardless of race, religion, sex, or class power is partially ascribed. Routes to power are circumscribed and limited by race, religion, sex, national origin, or class. Thus, sociopolitical power is usually limited to males, no Christian can rise to power in a Moslem society, nor a white in black African societies. And the Jew in many societies has been deprived of any power but that of employer. Moreover, there is the inherited power of monarchies and aristocracies, and the traditional power of certain families.

Thus, while interaction among some people having similar power may exceed that between those differing in power, power similarity alone does not predict mutual solidarity.

Status-theory's central point about status-disequilibrium is that the resulting strain, frustration, and ambiguity cause conflict.

At the psychological level, this conflict could be intropunitive, as with suicide.

Whether the strain and frustration will produce inward or outward directed behaviour depends on how wealth and power statuses balance. If power is largely ascribed and less in status than wealth, which is achieved, then antagonistic behaviour may result; if wealth is lower in status, intropunitive behaviour is likely. Disequilibrated people are a pool of the conflict prone

To whom will this antagonistic behaviour be directed? If, for instance, a person has ΩA statuses, what will be the object person's status characteristics? Clear answers are not found in the status literature, for the focus is on a person's status as impetus to action, on the actor; there is little concern with the object. The literature notwithstanding, the discussion heretofore provides an answer. Simplifying as before and remembering that the first status is wealth and the second power, the object can have AA, AΩ, ΩA, and ΩΩ statuses.

The ΩA and A statuses for actor and object is the worst combination. Not only is the actor Disequilibrated but so is the object, producing a reinforcing conflict atmosphere (as two angry individuals bumping into each other). Moreover, no status links exist to moderate misunderstanding and uncertainty resulting from their dissimilar statuses.

Consider now people jointly having A statuses (high wealth, low power). With two status links existing and being similarly unbalanced, they should have the least conflict. They can unite to improve their status, for they have common problems and bases of understanding.

In summary, a disequilibrated actor will tend to direct the most conflict behaviour towards a dissimilarly disequilibrated object. This actor would direct the least towards an object sharing the same disequilibrium.

Two people's status incongruence is positively correlated with their mutual antagonism. This conclusion is consistent with empirical results. For example, in their investigation of congruence and interpersonal conflict relationships in decision-making groups, researchers concluded that significant "differences in the incidence of interpersonal conflict were, without exception associated with the predicted effects of status congruence."

At the national level, the hypothesis relating status inconsistency and war was put to test and the results showed that the status inconsistency was associated with alliance aggression. On the other hand, at the arms level the results showed that there was a direct (but weak) link between inconsistency and war. It was concluded that status inconsistency as a cause of war is an important factor, and that differential changes in rank position are linked to conflict via their tendency to produce status discrepancies.

Self Assessment Questions

1) Define status disequilibrium concept.

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2) What factors contribute to disequilibrium?

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3) Discuss the statement given below: "Status-theory's central point about status-disequilibrium is that the resulting strain, frustration, and ambiguity cause conflict".

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4) How does status congruence operate? Show it with an example.

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3.7 STATUS THEORY

Generally, all social systems are conceived as stratification systems, based on the division of labour and differential social characteristics. Stratification is an ordering of people on some esteemed, desirable characteristic and a person's position in this ordering is his status. Contemporary sociologists consider the major status characteristics of societies as wealth (or privilege), power, and prestige. A person's wealth, power, and prestige comprise the person's statuses, and in combination they measure the total status of the individual that is his rank in the society. If we add class to these three status factors, the four together define the sociological space.

If one assumes that individuals or nations strive to improve their status, two basic behavioural propositions are to be considered.

i) The individual interactions increase as a positive function of rank. High status individuals or nations interact more with others than do low status ones, and those in low status direct behaviour upward in the hierarchy.

ii) The second proposition is that status Disequilibrated individuals, that is, those who are high on some statuses and low on others, will be frustrated and under stress, in turn leading to internal or external conflict.

The group of disequilibrated individuals is a pool of potential suicides, radicals, aggressors, or innovators. Though status theory has been elaborated, the above propositions and definitions constitute the empirically tested core of the theory in the social field.

There are six status assumptions to this theory and these aren given below:

1) Society comprises a stratified social system.
2) Some behavioural components are linearly dependent on status.
3) Status behaviour is directed towards higher-ranking persons, and the greater a person's rank the more his status behaviour.
4) The persons of High rank support the current social order.
5) People emphasise their dominant status and the other's subordinate status in interaction.
6) The more similar in wealth, the more people are mutually cooperative.

3.7.1 Status Components

Property as component of status

One of the important components of the status is property. Marx defined class by property ownership, where the bourgeoisie constitute those owning the means of production. People can have similar wealth (a status variable) and still have different property relationships to production and be in different classes.

Weber also considered property as status component, and according to the amount of property that one, the person is placed into one of the categories that extends from lowest to the highest status. These categories in turn also determine the class interest.

Thus the societies are stratified according to these classes, and the function of stratification is to distribute abilities and rewards in terms of these categorisations. That is, where those able to make the most contributions to society in its terms are most rewarded and the status dimensions reflect these benefits.

Stratification also results from specialisation and struggle for power. For instance doctors and lawyers by their specialisations are awarded certain nhigh status. So also those who struggle for power and use power to control others also have high social status.

At the same time, all social structures are not stratified. If one looks at the politically decentralised societies, these are headless societies resting "on general normative consensus." Thus, where political and status systems coincide, there is no unique social ordering and thus no stratification.

In regard to international relations, the international social status and political structures overlap that enables one to make political observations and generalisations about nations on the basis of a social status theory. However, sociologists generally use "stratification" only to mean the presence of a status system.

To observe that all societies are stratified is to note that they are social spaces spanned by status components. Status is not one attribute or position, such as a person's education or his being a judge. It is generalised evaluation underlying a cluster of manifest attributes and positions.

Wealth as component of status

Another component of status is wealth. Wealth is a status component for a cluster of beliefs and characteristics, such as a person's politics, residence, income, education, and manner.

The status-components of wealth, power, and prestige imply that three distinct "bundles" of attributes reflect status evaluations. To be more specific, a status-component of the dyadic field is a continuum involving societal consensus as to which end is better or more desirable. An ascribed status-component is one on which we cannot alter significantly his relative status; an achieved status-component is one on which we can so alter his location. A person's rank is his total status on the components. Status is esteemed, wanted. The status literature shows consensus on this, although authors place different emphases. For example, status is: superiority, equality.

Power as component of status

The amount of power a person has ion the society to control others or other aspects of society is the power component. It is not only the power that has been vested in an individual but the way in which the person uses the power decide the status of the person.

Prestige as a component of status

The amount of prestige a person commands in a society could be due to the person's contributions to the society. A family as a whole may be held in high prestige, as a result of their wealth, power, contribution that they have made for their society and community.

To have status is to put it in evidence. Thus arises Veblen's concept of conspicuous consumption. Status as a component reflects what is generally esteemed or desired in a society. And as previously postulated, there are three such components. One delineates the scarce and most desired resources of society at our personal disposal, that is property and wealth.

Also, wealth as a status component may differ from one society to another, as, say, between an abundance of wives, horses, cattle, material possessions, land, money. The common ingredient, however, in all such differential possessions is that they are prized by a society in which members differentially own or command them for their personal use.

The second status, power, is productive of effects. It is manifesting a desired behaviour or state, whether for personal, paternalistic, altruistic, or idealistic goals, and whether intentionally or not. There is a relationship between wealth, or command over resources for personal use, and power, or being effective. To control scarce resources is to have the power to produce effects to some degree. However, wealth and power are separable and distinct.

For instance when a wealthy person receives a fine for traffic violation from a lower income policeman. If the Prime Minister of India who wields enormous powers in the governing of the country owns very little personal wealth which is less than a cricketer. Or when a wealthy corporation president is unable to prevent his employees from going on strike or stop several expensive consumer court suits.

The other status-component, prestige, reflects the esteem of others, the degree to which they look to you for help, advice, or as a model of what they want to be. Wealth commands an abundance of desirable possessions. Power produces effects. Prestige generates favorable feelings, emotions, or interests. It is neither command nor producing effects, but emotive projection. Prestige partially results from having power and wealth.

Prestige can be occupational prestige or academic prestige, professional prestige, wealth prestige, power prestige and so on. In some societies, such as the international, prestige is almost wholly determined by wealth and power. Evidence supports that prestige for nations is dependent on economic development and power.

For example, Schwartzman (1966) asked respondents to rank Latin American countries by their "prestige or importance." The ranking was highly correlated with economic development and size (a power base) rank. Similar results were obtained by Alcock and Newcombe (1970) for Latin America and by Shimbori (1963) for the world's major nations.

Nonetheless, some individuals of low wealth and power have high prestige, as the winner of a gold medal in the Olympics or a much decorated war hero. Charles Lindberg's cross-Atlantic flight in 1927 is a dramatic case in point. Because one can have high prestige without wealth or power, or as in the case of a person disgraced in office, lose it although powerful or wealthy, prestige is surely an independent component of social space. However, there is usually a close relationship between a person's prestige, wealth, and power. Indeed, prestige is often a basis for developing wealth and power, as for an astronaut who becomes a politician or a high executive in a large corporation.

Also it is important to remember that a person's status is never permanent. It keeps changing, relative to a time and place, and to the distribution of statuses of others. One who begins with a comfortable middle-class wealth may find that in spite of constant income and solid possession like an automobile, two-bedroom home, and television set, that in time his status deteriorates as an increasing standard of living and inflation makes his wealth look very ordinary.

The difference in status between two people therefore cannot be an absolute measurement but two people may differ by virtue of not only their own wealth and power, but also as a function of the distribution of these statuses in society.

Thus the status-component reflects the relative and subjective nature of status. The location of a person in the social space, the person's status position etc., are thus relative to societal context, standards, and desires.

3.7.2 Status Mobility

Just as we have needs of hunger, sex, protectiveness, security, curiosity, and so on, we also have need for achievement etc. Although the need is called self-assertion, high achievement motivation is supposed to be in effect the drive for status. It is a concern for one's salary, excelling colleagues, commanding admiration, having a good reputation.

As a need, status is a fundamental source of sentiments and interests. It contributes to the formation of the "I wants of our motivational field and provides direction to our goals. Most important, status as a need is a force towards upward status-mobility. That we desire to improve our status is a commonplace of everyday observation, introspection, and sociology.

The why of this universal urge is explained by its nature as a fundamental psychological need? What is not so clear is that people with unbalanced statuses prefer to balance them, indeed, prefer to equilibrate (balance) their statuses before further upward mobility on the highest status.

The psychological explanation for this is that unbalanced statuses create an uncomfortable cognitive dissonance. I will deal with dissonance later. To be more specific about this, we can adopt a simple way of illustrating status propositions. Call the high status person an alpha (A); the middle status one a mu(M); and the low status one the omega (Ω). Throughout this chapter, the first status noted will be always wealth, the second, power. Then, a person high on wealth and low on power can be described as an AΩ. Such is a wealthy used-car salesman. A person high on both is an AA, such as the Vice President of the United States.

Adopting this simple notation does not imply that status is dichotomous. Status is a continuous variable. However, the development can be simplified and pencil and paper tests of its internal logic conducted by considering just high, medium, and low statuses (or only high and low). For a deduction true for a continuous variable also holds for dichotomous and dichotomous cases. The simplification spotlights logical error, contra-intuitive constraints, and predictions without a full-scale empirical test.

Now, an AA person is balanced, as are MM and ΩΩ ones. Such combinations as ΩA, AΩ, MA are unbalanced. The desire to equilibrate status means that an

MΩ person, for example, will try to raise the Ω status to an M. His need for status rules out equilibration by decreasing M to an Ω. Jointly, the needs for equilibration and for upward mobility imply that an unbalanced person, such as an MΩ, will prefer elevating Ω to M before increasing M.

Self Assessment Questions

1) Discuss Status theory?

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2) What are the status components? Delineate and describe the same.

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3) Discuss prestige as a component of status.

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4) What do you understand by the term status mobility. Discuss with an example.

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3.8 SOCIAL LEARNING THEORY

Social Learning Theory assumes several factors that play important role in whether or not people's actions are based on what they have learned. According to this theory, important factors in learning are cross cultural awareness, culture, language, socialisation, roles, attitudes, rules, and behaviour modeling.

The Social Learning theory is unique as a learning theory which states that behaviour can be reinforced by one's own self, as well as by others who may desire a certain behaviour from the individual. This reinforcement can be immediate or delayed.

The social learning theory has been studied and the results have shown that:

i) those who have had close contact with persons of a different ethnic background should show less social distance between themselves and the out-group than persons who have had limited or no cross cultural experience.

ii) Persons from an urban background should have had more opportunities to interact with other ethnic groups. Following from hypothesis #1, they should place less social distance between themselves and the out-group, than people from a rural background.

iii) Females are socialised to be more caring and nurturing than males are. Women have traditionally been discriminated against and should be more empathetic to minority groups than men are.

iv) Women are not criticized for being emotionally involved, as men frequently are.

v) Women band together to secure equality in the work-place. This should produce less social distance than men place between themselves and out-groups.

vi) Religious persons are usually in close contact with people who share the same beliefs.

vii) Religions are not noted for being overly accepting of other religious groups. That is, ther e is more social distance aongst the different religions.

viii) Religious organisations are generally stratified along racial lines. Persons who attend religious services frequently place more social distance between themselves and out groups.

ix) Individuals who are highly educated have had a greater chance to associate with other ethnic groups. They should have less social distance then less-educated persons.

x) Furthermore, since parents constitute powerful role models, respondents with highly educated parents should also place less social distance between themselves and out-groups.

Kurt Lewin placed field theory on the map in social psychology. In particular, he argued that behaviour should be defined as a function of both personality and environment. It may also be stated that environment is a function of personality, and personality is a function of environment. Thus one could state that behaviour, personality and environment are highly inter related.

Since we all move through time at the same rate of one kilometer per hour, we tend to ignore purely temporal movement when understanding our own actions (with the exception of "waiting,")

Movement thus needs to be analysed not in terms of locomotion through physical space but as directed action in the field—an "aim path" of striving.

Third, the animal (or person) has conceptions of likely changes in the field at any time. These changes are produced both by the animal's own motion through the field, and by internal developments of the field itself, which may and may not involve actions taken by other animals in the field.

This has two implications. The first is one additional dimension must be added to the already busy diagrams. While Lewin figured out reasonable ways of accomplishing this, there was a practical problem of how to use paper to represent increasingly higher dimensional figures.

Secondly, a more important implication is that the past cannot directly affect the present.

In contrast to what he considered primitive views of causality, Lewin argued that behaviour should not be seen as caused by something in the past (let alone the future), but must be grounded in an understanding of the totality of the current situation.

This "principle of 'contemporaneity'" flows directly from the fundamentals of field theory. There were severe limitations built into Lewin's definitions, especially in so far as he tried to make the field wholly psychological. Most important were the limitations in his conception of valences. A valence is something that pulls one towards or pushes one away. The field itself may be seen as the product of many valences, as for example, a gravitational field may be seen as the product of many objects each with its own gravitational field.

Lewin's theory was enormously influential among a moderately sized subset of social Psychologists, attracted by the comprehensive nature of the philosophy, the personal charisma of certain believers, the promise of formalisation, or the social activism underneath.

3.9 LET US SUM UP

Social distance describes the distance between different groups of society and is opposed to locational distance. The notion includes all differences such as social After defining social distance, we took up social distance scale propounded by Bogradus and had an idea about the same. Then we dealt with types of social distance which included affective, normative, integrative social distance.These were also called as dimensions of social distance. Following this we took upo the description of social distance scale and discussed four zones of social distance, namely public zone, social zone, intimate zone etc.

Since social distance is related to social status in all its perspectives, we discussed how Status is important for understanding social behaviour. This was followed by social status and behaviour which indicated how important is the rank of two people is in order to understand their behaviours. The higher rank person will behave in a different wsay and the lower one will try to imitate the higher rank person. Then we took up the satus disequilibrium and described the issue in detail with a few formulas and examples. This was followed by status theory which stated that every individual tries to improve his or her status in the society and even Nations try to do the same. The theory describes how a person's wealth, power, and prestige comprise the person's statuses, and in combination how

they measure the total status of the individual that is his rank in the society. If we add class to these three status factors, the four together define the sociological space.

The status components were taken up for discussion which consisted of property, wealth, prestige etc. This was followed by considering status mobility and a discussion of social learning theory. Social Learning Theory assumes several factors that play important role in whether or not people's actions are based on what they have learned. According to this theory, important factors in learning are cross cultural awareness, culture, language, socialisation, roles, attitudes, rules, and behaviour modeling.

Kurt Lewin placed field theory on the map in social psychology. In particular, he argued that behaviour should be defined as a function of both personality and environment. It may also be stated that environment is a function of personality, and personality is a function of environment. Thus one could state that behaviour, personality and environment are highly inter related.

Lewin's theory was enormously influential among a moderately sized subset of social Psychologists, attracted by the comprehensive nature of the philosophy, the personal charisma of certain believers, the promise of formalisation, or the social activism underneath.

3.10 UNIT END QUESTIONS

1) Elucidate comprehensively the concept of Social Distance.
2) How did Bogardus measure Social Distance?
3) Enumerate the implications of Social Behaviour with suitable examples.
4) Critically evaluate Social Learning Theory.
5) Explain the significance status distance in Social Behaviour.
6) Critically evaluate Lewin's Field Theory in relation to sociocultural field space and forces.
7) Discuss the Social Learning Theory

3.11 SUGGESTED READINGS

Donn Byrne, Robert A. Baron, (2004), *Social Psychology*, Pearson Education, Inc, Tenth Edition. London

Lewin, Kurt. (1951). *Field Theory in Social Science*, edited by Dorwin Cartwright. New York: Harper and Brothers.

Mey, Harald. (1972) *Field Theory: A Study of Its Applications in the Social Sciences*. New York: St. Martin's Press.

UNIT 4 CONFLICT IN THE SOCIAL CULTURAL FIELD, THE ELEMENTS AND PROCESS OF SOCIAL CONFLICT, THE NATURE OF POWER, SOCIAL POWER AND FAMILY POWER

Structure

4.0 INTRODUCTION

Social conflict is exclusively an aspect of social power. To understand social conflict we must deal at the level of social powers and their related factors. When two persons or more than two persons clash with each other verbally or physically, there is a conflict and in a social situation it turns out to be a social conflict. The social conflict cannot be understood without taking into consideration the social power as most of the conflicts that emerge in a social situation is related to the power one has and the power one is able to wield. In this unit we would be dealing with the above factors, in addition to the nature of social power and family power and how these affect individual's behaviours.

4.1 OBJECTIVES

After reading this unit, you will be able to:

- Define social conflict;

- Describe the complexities of social conflict;
- Define the nature of power;
- Describe the diverse aspects of social power and family power; and
- Analyse social conflicts and identify the solutions to resolve the same.

4.2 DEFINITION OF SOCIAL CONFLICT

Conflict is the confrontation of powers. But power takes many forms. Power can be identified. It can be assertive, altruistic and manipulative, coercive and physical, and so on. Some powers are intentionally directed, as are assertive and bargaining powers; Some powers are directed wholly towards a person's body, as is a blow to the body or application of force to make the person submit. There are other powers that are directed through another person or another medium or self such as the inductive and intellectual powers. All these powers may conflict. Social conflict is not limited to hostile or antagonistic opposition. It is not wholly a clash of coercive powers as often is implied, but refers to any opposing social powers. Thus, the conflict of intellectual powers may be manifested through debating, arguing, or disputing. The conflict in regard to bargaining is manifested through haggling, negotiating, dickering, bartering, or exchanging. The authoritative powers can be manifested through adjudicating, appealing, or documenting. As for altruistic powers it is manifesting through accommodating, obliging, or benefitting.

By definition, social conflict refers to conflicts between the various groups and individuals within and across social groups, especially related to the use of power. The social conflict means intentionally taking into account other persons ion the environment or in the society. In social conflict the persons concerned use power to produce effects, and social power is an intentionally directed measure to produce effects on the other person or through another person. Social conflict is then the confrontation of social powers.

Furthermore, social conflict is exclusively an aspect of social power. To understand such conflicts we must deal at the level of social powers and their varied factors. Also as mentioned earlier social conflict is not limited to hostile or antagonistic opposition only, but it can be conflict involving intellectual power, physical power, psychological power, bargaining power and authoritative powers. There is another important social power viz., altruistic power which manifests in terms of accommodating, obliging, or benefitting. Thus the social conflict manifests itself in terms of use of varied types of social powers depending on situations and the contexts in which it occurs.

Very often the physical power or coercion used to make another individual submit is considered as violence. At the same time, the existence of violence does not presume an underlying social conflict. In order to understand whether socal conflict ends up in violence or violence as such triggers use of social power and vice versa need considerable analysis and the following section deals with the same.

4.3 VIOLENCE

Violence means a physical painful attack on another person or persons by an individual or group of individuals. Violence however can also be non physical

but verbal. One can attack violently another person verbally in abusive words and shouting at the person without so much as touching. Violent verbal attack can also be seen in writing, attacking verbally the other person on the phone, or on the internet, etc. In general, violence connotes an intense manifestation of strength, usually involving some severe physical or emotional effects on the person attacked. One has also seen violence in nature in terms of the violence of a thunderstorm, earthquake, explosion, stampede, and so on.

As one looks at violence between people, where they kill each other, fight each other, beat each other, go on rampage and war, one finds that all these are mostly related to social conflict, a balancing of social powers.

In much of the conflicts, people intentionally try to produce effects through either another's self or one's body. We may use threats of force or apply actual force such as torture or a beating to coerce another person to to do what we want. Or we may ignore the other's will and simply use physical force on the person's body, such as dragging the person struggling into a jail cell. Whether it is a case of coercion or of physical force depends on the intent of the user.

Violence directed towards coercing another's will comprise either a threat or deprivation, and is an indication of the application of coercive power. For example, twisting another's arm to make him reveal a secret is coercion, or beating up another person to show what will happen again if he does not yield to your demands. If violence, has some purpose aside from another's will, then it is physical power, such as killing another to be rid of him, or a war of extermination between neighboring tribes.

Physical force is not social, in that it is not oriented towards another self. In so far as violence is involved in physical force, violence is not social and does not manifest social conflict.

Violence, of course, may be the result of emotions engendered by conflict and constitutes reflex behaviour, as in the lover's slap or the family quarrel ending in wild shooting.

Violence can also end a social conflict, wherein a person impatient or unhappy kills and get rid of the person thereby achieving balancing of social powers.

Thus negotiations between political factions for national leadership may end in a coup d'état or assassination. Social conflict is an engagement of selves. Violence directed only at objects or bodies is not social. If violence is a means towards coercing another, it is a manifestation of social conflict. From the brief analysis of violence above one can state that violence as a phenomenon, therefore, appears fundamentally ambiguous, in that whether it constitutes a reflex behaviour, physical force, or coercion, whether it manifests social or nonsocial conflict, can be determined only by reading the associated field of expressions, by assessing intentionality.

4.4 CONFLICTS OF INTEREST

All social conflicts involve interests. A person's interest is a vector of power. It is the person's attitude plus the strength of attitude that produce the effects. Social

power is a social interest, that is the person concerned uses his power against another person or other persons in the interest of self or society. Social conflict is the opposition and balancing of such interests and within the psychological field an interest consists of situation, actor, goal and object.

An interest is also a part of an individual's dynamic motivation. The strength of the interest is generated by our needs, and its content and direction are partially learned from experience and culture, and partially rational. Fundamentally, an interest is an "I want something , say 'x'," where x can refer to a positive good (I want to end corruption in society). It may also involve positive interests or a negative good (I don't want to cheat my father), called negative interests. Two negative interests (I don't want to cheat father but I also do not want him to deny giving me money) involve coercion in that the two interests which are of negative nature make the person concerned take to violence to make the father give him the money or resort to cheating by stealing the money from father's wallet.

Coercion, for example, inextricably links two negative interests and to give another example, I don't want the robber to kill me, but I don't want to give him my money.

Definitions of social conflict vary as to whether they emphasise antagonism, tests of power, competition, incompatibility of interests, or mutual awareness of incompatibility. Part of this definition is the idea that two people are consciously competing against each other in regard to some mutually exclusive good. This exclusive good could be a lover, a piece of property or a position in the office or even then top grade in then school.

There are three kinds of conflicts of interests and, recognising conflicts as a balancing of powers, seven conditions are present for a

1) Social conflict occurs when both individuals i and j want the same thing or desire the same thing, as for example ' x' that is a mutually ungratifiable positive interest. That is, the satisfaction of the interest by one excludes the other (such as conflict over who will be mayor. If one becomes the Mayor the other cannot). This is a conflict of congruent interests in that both desire the same thing.

2) Another conflict is i wanting 'x' and j wanting 'not x'. A Vice president of a company may want to increase the profits at the cost of making people do more work in the company by paying extra amount for those extra hours of work. The labour may not want this as they are not profit oriented and feel that whatever the profit the company earns has given tem all a lot of bonus etc. They do not want to do extra work. To give another example, a child may want a chocolate, but the mother may want the child to have none. Thus the conflicts here are of inverse interests, with one wanting it positively and the other denying it negatively.

3) There is yet another kind of social conflict in which when i wants 'x', and j wants 'y', where x and y are incompatible. For example, one person may want the company to remain profit oriented, while another may want it to become more socially responsible. A husband may want to stay home and rest while his wife wants to go on a family picnic;. A student wants to become a psychologist but his parents want him to be a doctor. This is a conflict of incompatible interests.

How can conflict end in a balance? To use a more popular phrase, how is conflict resolved? Presented in the table below, there are ways to balance conflicts of interests.

Table : The conflict and method of management of conflict

S.No.	Both I and j want X	Mode of Resolution
1.	X is connected to a positive Y. e.g. X=Land and Y = Money	Exchange (through promises)
2.	X is disjunctively linked to a negative Y e.g. X=one's purse with money Y = Losing one's life	Coercion (through threats)
3.	X is decidable by norms or rules e.g. X = A Mayor's Office	Authority (Through legitimacy) e.g. an election
4.	X is decidable by reason. E.g. X=A scientific honour	Intellectural (through persuasion)
5.	X is decided by Love. E.g. X= To use the car	Induction (through altruism)
6.	X is decidable by manipulation e.g. X= to marry Ms.M	Manipulation (through control over potentialities orm opportunities)
7.	X is not resolvable by above e.g. X = Governmental control	a) Abdication (through giving up X) b) Physical power (through force)

The following inferences may be drawn from the above table:

1) Resolution, or balance, is obtained if the interests are exchangeable. That is, j gives x to i in exchange for y, or vice versa. Barter systems are based on this fundamental linkage between positive interests. In fact the present day market systems are exchange systems operate this way.

2) In every society, there are innumerable conflicts of positive, inverse, and incompatible interests between individuals. They crosscut and segment individual motivations in diverse directions. The market system helps prevent their crystallisation into system wide cleavages.

3) Another method of resolving conflict is through threats. One party links disjunctively the positive interest to some negative interest. To give an example, one person may state that if you don't let me have x, then I will kill you, burn your house down, or continue twisting your arm. The threat of imposed or continued deprivation, constituting the negative interest, also transforms the positive one ("I want to keep my wallet") into a negative one ("I do not want to give up my wallet"). For it is no longer a question of the power with which i wants x, but rather the power with which i does not want to give up x to j.

4) One realises that giving up x under such circumstances is a sign of weakness which may encourage other such threats in the future. This strengthens the will to combat or endure the threat. Nonetheless, coercion is a time-honored

way to resolve conflict, for if the threat of force is disproportionate to the negative interest of i in not giving up x, i will yield.

It is thus that governments have always extorted taxes from their citizens. Coercion is a polarising solution. In an exchange, however, both parties satisfy positive interests. The resolution is satisfactory to both, otherwise an exchange could not have been voluntarily concluded. The resulting balance of powers thus stable and specific in being limited to the interests and people immediately involved.

With coercion, the resulting balance is unsatisfactory to one party, who continues to harbor an interest in overturning it, and is maintained only by the continued threat of the other. The use of this threat to win x now implies its possible use against other positive interests of i. Indeed, the successful use of coercion against i creates the potential for i to ally his interests with others similarly coerced to jointly oppose j. Of course, j is encouraged to increase his power to coerce this group, which would mean also aligning with others interested in opposing i's group. Thus, coercion carries within its use the tendency to divide, to polarise society. It is the agent of class struggle.

As the table shows, there are many ways of resolving conflicts besides exchange and coercion. However, for one reason or another these may be undesirable or unworkable.

One can then abdicate the interest. If success does not seem worth the cost, x may be left to the other person.

On the other hand, one can resort to naked force. For example, if persuasion, negotiation, and threat of war do not settle a boundary dispute, then the territory may be militarily captured. While coercive power balancing and balances do not necessarily involve force the intentional use of force is usually the result of such balancing or a breakdown in a coercive balance.

Thus it is seen that there are different conflict of interests such as the inverse interests, and incompatible interests. We also have strikes, riots, arguments etc which form another type of conflict and again conflict of interests with the striking union wanting certain things of their another way to classify conflict is in terms of its being realistic or unrealistic. Realistic conflict is that of interest, of power, between parties who are aware of the conflict and are intentionally trying to gratify their opposing interest. All social conflicts are invariably realistic, involving an intentional orientation towards other persons.

Unrealistic conflict is antagonistic behaviour resulting from individual frustration, aggression, or pugnacity. This conflict is a kind of reflex behaviour released along lines of antagonism, such as a family brawl, a race riot, or a wild shooting spree. Unrealistic conflict is not social and another way to divide conflicts is in terms of the subject. There are conflicts of facts, of practices, of goods, and of ideas. A disagreement over a fact can engage opposite interests, can involve status or esteem. An arrogant style can invoke a desire to be right. Or facts can be crucial to deeply held ideas about what is right and wrong.

Conflicts of practices or rules, what is sometimes called conflicts of rights, concern the correctness or applicability of formal or informal norms. Do regulations governing television apply to cable TV? Are anti-pornography laws constitutional?

Is a part-time worker eligible for unemployment compensation? Should a significance test be applied to a correlation coefficient based on a population of cases? Disagreements as to the answers to such questions also can be decided in a disinterested fashion.

However, questions of practice often are imbedded in normative framework, such as whether government ought to be more involved in regulating society or whether a scientist ought to be governed by methodological rules. These disagreements become conflicts of interest between the wants, desires, and needs of the opposing parties. Conflicts of goods are conflicts of positive, inverse, or incompatible interests. Two people want the same office; two disagree over a debtand so on.

Conflicts of ideas, or ideological conflict, concerns what is right or wrong, good or bad, just or unjust. These arise because of certain typical orientations of persons as belonging to Buddhism, or Hiduism, or Materialistic orientation or Communism etc. Here the conflict is amongst the systems of values and norms arising from their orientations. Such conflicts are always conflicts of interest, and involve needs, sentiments, the superego, and a person's super ordinate goal. Conflicts of ideas are pure conflicts of social power.

4.5 SOCIAL POWER AND SPECIAL POWER

Social power refers to the capacity to produce effects, that is using that power one should be able to make another person or persons to do what you desire. There are two factors involved in social power to have its effects, viz. the intentionality and orientation towards another person's self, apart from their body.

Social behaviour has clear intentional orientation towards another self. This orientation takes the other self into account in terms of one's acts, actions, or practices. The essence of social power should be parallel, that is it must have the capacity to produce effects through another self. Power is physical and not social when purposely employed to affect another person. Physical power applied in opposition to another's will is force. Getting a person to willfully give you something is using social power. But knocking them unconscious and taking something from them is the use of force. Social power works on the other's perceptions, dispositions, interests, will, and all other aspects of a person's self. Physical power, however disregards the pother person's self and and uses physical means to take or get whatever one wants. Depending on what capabilities are employed, social power has different forms. Let us now deal with some of these social powers.

4.5.1 Coercive Power

Coercie power is the ability to make others do what they would not otherwise do. The means of coercion may vary such as use of weapons, the military, the police, jails, sanctions, threats, and so forth. There are other forms of power which involve cooperation, love, exchange etc. In addition other powers include power of competence, altruism, love, and rewards. Love and power have been seen as opposites, rather than essentially entwined. Justice has been seen as ideally independent of such power, rather than as based on effective power.

Let us take an example of i and j as before. Let us say that i has interest in X and j has interest in Y. Now both X and Y can be negative or positive interests. That is, positively the person may say "I want . . ." or a negatively say "I do not want. . . ."

Let X be positive for i and negative for j. For example, X may be j's wallet which i wants and which j does not want him to have. For i to overcome j's negative interest X, while avoiding force, i must tie X to another positive or negative interest Y. This will make j have a balance preference of X to Y. This can be done by threatening that if j does not do X, then i will do (or refrain from doing) Y. For many, accepting official law is such a negative interest manifested only because of the connected threat of sanctions if the law is broken. The outcome then basically depends on the relative strength of the two negative interests. Between the wallet (money) or one's life. The choice is between lying to convict a friend or a long jail term for oneself, the choice is not so clear. Coercion is more than a threat of some future sanction, however. A tortured spy can be threatened with additional suffering unless he yields the desired information. Here, as in kidnapping or posting bond, a deprivation is first applied, followed by a threat to continue (a negative interest y) if you do not accept the negative interest X (giving the secrets, paying a ransom, or appearing in court). This kind of coercive situation for j is also characterised by two negative interests between which the person must choose. In both situations of coercion, j's self is placed by i's threat between two powers, both of which are negative interests. Escape from this is prevented by two barriersas shown in the figure below:

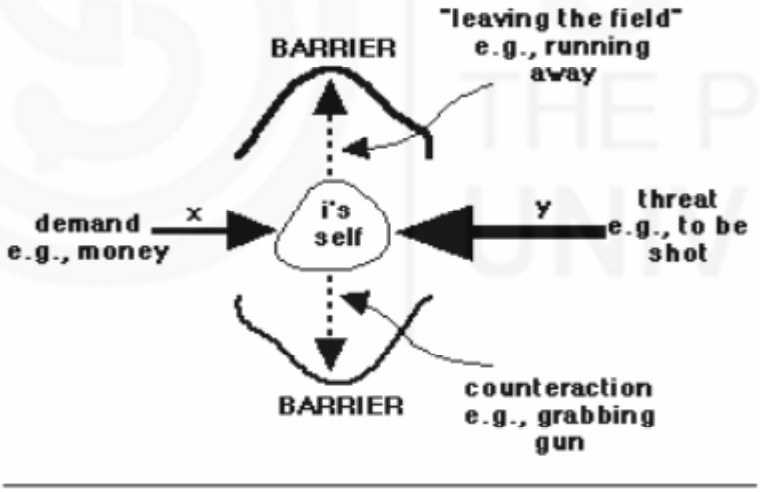

Figure the two negative interests are shown as vectors bearing on the self. The length of the vectors indicating their strength. As in all psychologically conflictful situations, when i is coerced he would prefer to "leave the field," to run away from the threat. But this may be blocked, as shown by the barrier in the figure, by one's physical weakness or by physical surroundings, thus forming a barrier to escape.

Another possibility may be counteraction, such as grabbing for the gun, producing one's own gun, calling for help, and so on, but this "escape route" also may not be possible, forming another barrier. With these counteractions blocked, only a choice between the threat and demand may be left, and the choice will depend on which of these two negative interests is stronger.

Negative wants are outside powers bearing on the self. They are powers imposing undesired goals. When being robbed, both "escaping from the field" and others counteractions are positive interests, and thus moving outward. If positive interests are blocked one must choose between negative interests. Then the choice will depend on which negative vector is strongest. In this case Y is the stronger negative interest, the more powerful "I do not want . . . ," and thus X would be chosen over Y by i. Note that coercive power confronts the self with a double negative bind. Nonetheless, the self has a choice, even if between two negativesand therefore chooses willfully. A coerced individual's will is free, and in this lies the great unpredictability of coercion. On the other hand, force is predictable that is if a person hit on the head hard enough the person will be immobilised. A number of policemen can carry a person resisting arrest into the wagon. Also a person's opposition can be eliminated by killing him. But in coercion, a self faced with two negative alternatives controls the final choice.

Nonetheless, the choice of an interest X can be made more probable by increasing the power (negative interest) of Y. We do not know what j will do if i demands the turn over military secrets (X) or be shot (Y). He may be a patriot. Honor or self-esteem may simply not allow him to betray his country to save himself. But, if j is threatened with the slow torture and execution of his family and is himself undergoing torture, his choice of X becomes more probable.

Thus coercive power is a capability to threaten a person into choosing one undesirable behaviour over another. The success of coercive power depends on the strength of the barriers against escaping the threat and the strength of the two negative interests. If one negative interest is much stronger than accepting the threat, then coercion may be defeated. For example, a POW threatened with being shot if he doesn't divulge military secrets (a threat from which there is no escape), then he may say "Never! Go ahead, kill me."

Coercion is fundamentally a coupling of expectations and motivations. For example, "If you do not pay your rent, I will evict you." The link between the resulting expectations of deprivations and the negative want is through the psychological field.

A negative want does not stand alone. That is, the psychological field of coercion involves fundamentally another's behavioural dispositions and his expectations. His actual behaviour, then, is a weighting of these dispositions within the coercive situation by his associated expectations of the outcomes.

The success of coercion, is then a function of these two variables, that is a person's behavioural dispositions, which is the negative interest X transformed through the person's psychological field, and his expectations, which relate negative interest Y to X within this dynamic field. This success will depend not only on the strength of the negative interest, but also on the credibility of its threatened manifestation, that is the expectation that the threat will be carried out.

For instance, if an indulgent parent uses hollow threats to keep his children in line, they soon will ignore the threats. Thus the parent's coercive power over the child will be weak. Credibility is a crucial concept in understanding coercive power, for the degree to which another expects a threat to be carried out determines

how seriously the negative interest will be taken. If the threat is incredible, then from j's perspective there is no coercion, for he has no opposing alternative negative interests to choose between.

To conclude one may state that (i) the negative interest of a person is a goal which the person does not want and the strength of this feeling is against it. (ii) Coercion is when the individual has to choose between two negative alternative interests with one being a threat makes the other the likely choice. (iii) The success of coercion depends on the expectations of the threatened negative interests, that is the threat's credibility in that how far it will be used.

4.5.2 Bargaining Power

Coercion is characterised by two negative interests connected by a threat. Bargaining power is characterised by two positive interests connected by a promise.

Consider again two individuals i and j and now two positive interests x and y, each being of the form "I want. . . ." Let the situation be such that for i to gratify one interest, he must give up the other. For example, in order to buy a new car (one positive interest) you must give up considerably money (another positive interest). To get money, you must give up some of your time to work. To develop a skill, you must devote considerable time to practice. And so on. Our lives are full of such trade-offs.

Bargaining power involves two people having positive wants they can exchange. Each can forgo the gratification of one want in exchange for the other. Such exchange relationships not only refer to goods and money, but any positive interests whatsoever. Thus, a girl may yield to a boy's overtures in return for his promise of love; a colleague may be highly supportive in return for similar support. All these are positive interests or in economic terms, goods.

If through bluff and haggling, i, for instance is able to exchange the minimum y he is willing to give up for the maximum gratification of his interest x, then j has given up his maximum x for a minimum y.

Then i has more bargaining power than j. For example, let us say in looking for a new house you see a suitable one that you and your mate both decide is worth as much as Rs. 4,00,000.00, a sum you could handle in your budget. The owner, however, is asking for Rs. 3,80,000.00. Knowing that the initial price on a home is always negotiable, you offer Rs. 3,40,000.00 Finally, after bargaining, you both agree on Rs. 3.65,000.00. Since you were willing and able to go Rs. 4,00,000.00, you had more bargaining power than the owner in this situation. In fact you paid less than you were willing to pay. The owner received less than he could have had.

To sum up, it can be stated that a person has bargaining power if he can exchange his interests with others. He has greater power than another if he gets more for less than he was willing to give up. Thus one can define bargaining power as a capability to use promises to entice a person into choosing one behaviour over another.

Note the similarity in bargaining and coercive power. Both work through another self. Both involve two alternative interests tied together. Coercion, however, involves two negative interests. Bargaining involves two positive interests. In coercion, one generates a negative interest to cause another to select a connected undesirable alternative. In bargaining, one generates a positive interest to cause another to select it over a connected desirable alternative.

Psychologically, how do coercion and bargaining compare? Coercion works through expectations. By posing a credible threat of something unwanted, one tries to get another to select an alternative negative interest.

In bargaining, however, one uses promises of rewards rather than threats of deprivations. One hopes to induce another to accept the reward in exchange for another positive interest.

And as in coercion, credibility is crucial. A person by reputation or by his previous behaviour or commitments, or his capability must show that he can and will follow through on his promises.

Let us now take up the domain of bargaining power. This form of power is often confused with economic exchange, such as in bartering possessions or buying and selling goods and services. This is only one arena for bargaining power.

The domain of bargaining power comprises all social relations. It is present in the exchange of status deference for protection, sex for security, or agreement for promotion.

It is involved in the exchange of compliments, greetings, dinner invitations, letters.

Indeed, it underlies all social exchange, all situations of social reciprocity.

Implicit in social exchange is a promise of a reward in exchange for some action.

The promise need not be enunciated, but may be implicit in the other's field of expression or in the social relationship.

Economic exchange is usually explicit ("I'll give you five dollars for that book"), but this does not constitute a difference of kind, but of degree.

The same form of power is involved, as in "I'll scratch your back, if you'll scratch mine." The commonality is the presence of some mutual positive interests x and y, such that one person can exchange x for y and another y for x.

Since power is a key concept, let us see some of the definitions of power which are examined below:

1) Power is the production of intended effects. If intentionality is omitted from this definition, it would be similar to power as a capability to produce effects.
2) Power is the ability to employ force . This definition confounds the difference between It does not take into account power in terms of noncoercive forms.
3) Power is when one's behaviour causes another's . This is a broad definition overlapping power in its various forms. As a person with power behaves, it affects others. One can affect another's perception, intentions, temperament, and moods without affecting his behaviour. In fact you may cause another to reassess his goals without changing them. This definition misses power's

essence. It neither captures the genus or species of power, and only obliquely taps its many forms.

4) A person i has power over another person 'j' to the extent that 'I' can get 'j' to do something that j would not otherwise do .Here power is defined as a form of power, that is coercion. And the definition is restricted to having as distinct from exercising coercive power. And other forms of power are ignored or unappreciated.

5) The power of 'I' over 'j' with respect to a given change equals the maximum strength of the resultant force which 'I' can set up in that direction, where strength is determined by the relative magnitudes of the forces activated by 'I' to comply and resist (Cartwright, 1959).

   This definition is dispositional and involves intentions. It is a general definition, since it only refers to a resolution among psychological forces. It ignores physical power (force) and other nonintentional forms of power.

6) Power is the ability to satisfy wants through control over preferences and/or opportunities. Here also power is dispositional (ability) and intentional (control), and involves both coercion and bargaining (in my terms). Ignored by the definition are force, unintentional power, and other forms of social power, including manipulative power.

7) Power is the relation between two parties modally characterised by (1) asymmetric influence, and (2) the predominance of negative sanctions (threatened or actual) as a feature of behaviour in the dominant party . This makes power something more than a disposition. It is a "processual relation," a movement towards something. In form, it is coercive, with the emphasis on negative sanctions and resistance (negative interests).

8) Power is the process of affecting policies of others with the help of (actual or threatened) severe deprivations for nonconformity with the policies intended . Here again, only one form of power is defined: coercion. Power as they define it does not include force (in my terms). It is pure coercion.

9) The essence of power is command Power is something one has, which is actualised in being able to get others to do what is wanted. It is therefore dispositional and intentionally exercised. And it can take the form of coercion, altruism (one obeys out of love for the person or his cause), or authority. It ignores bargaining, manipulative, and intellectual powers, in which no command need be involved, as well as force and, of course, the other unintentional forms of power.

10) Power is the ability to cause or prevent change . Here the essence of power is the capability to do something.

Power has been analysed into its forms and characteristics. The differentntypes of powers and the different components of power all act and interact together and no not act independently. Similarly, power in its various forms and characteristics are united in reality, although these are analytically separable.

Concerning social interaction particularly, the various forms of power can all coexist in the same relationship, forming a balance, a power field. Thus, even in an innocuous conversation with a stranger one may use manipulative power in steering the person conversationally towards my interests.

All the forms of power are present and active in a unified but invisible whole. It is the overall concrete resources of power reflecting this whole. which comprise power as status. On this, let me briefly consider status again.

4.5.3 Power as Status

As a status, power means having power. It includes both the resources of power and their effective manifestation. It also includes all forms of power or their combination, depending upon the situation. Status is a bundle of characteristics upon which there is consensus as to their desirability. One such cluster is wealth, or a person's command over an abundance of desirable possessions. Another is prestige, or a person's honour, respect, desirable reputation, or glamour.

Power is a cluster that combines those capabilities underlying power in its various forms. As a cluster, power is a component of social space. It locates people in social space by virtue of their over-all capabilities for exercising power in all its social and nonsocial, intentional and unintentional, and coercive and no coercive forms. Thus, power as status is clearly a generalised component. It subdivides into different aspects, elements, and forms as previously discussed.

4.6 ESSENCE OF POWER

Power is a concept basic to understanding a reality of potentialities and actualities. Let us see what is power within this view. (i) First, power is the linkage between different states of being; between potentialities and actualities, between dispositions and manifestations, and between determinables and determinants (specifics). (ii) Power is that linkage that is a strength of becoming, an active will to completeness. It is a push from the level of pure potentiality, of mere possibility, to ever greater levels of clarity and definiteness. (iii) Third, it is an imminent energy, an inherent force towards identity of all beings. (iv) Fourth, it is a vector whose direction is towards greater specificity, determinateness, completeness, identity, and whose magnitude is the strength of becoming, will to completeness, and force towards identity of a being. This is saying that power has a direction, that is it is "pointed" at something and it represents the strength to actualise a potential of some kind. (v) Finally, in essence, power is a vector towards manifestation.

4.6.1 Power, Relative or Absolute

Is power as understood here relative or absolute, a quality of being or a relationship between being? Overwhelmingly, social scientists have defined (social or political) powers as relative. According to this view, power is some kind of ability of a person to impose himself on another.

This ability must be relative to the other, and the conception is therefore comparative.

At the same time, power has the capacity to produce effect. It comes from within a being as a pushing towards ever more completeness. In this meaning, power is a quality of being. It is absolute and no relatives. When we consider our power, therefore, we must separate two aspects. There is, first, our power toward distinctiveness as a living being, which is as a capacity to produce effect. This is a human quality, no less distinctive of our individuality than our personality.

4.6.2 Identive Power

Most discussions of power imply that it is an ability to achieve intended results, usually in terms of getting some other person to do what he would not otherwise do. The focus on intention illuminates one face of power and power is a capacity to produce both intended and unintended effects. The unintended manifestations for example refers to a person's mere existence causes others to take notice, to take him into account, to compensate for him. As he walks down a sidewalk, he has the power to become manifest in the perception of other pedestrians, and to produce compensating movements. If he is well dressed, young, and handsome, he has the power to attract admiring glances. If he is also tall and muscular, he may cause some especially timid souls to be careful they do not bump into him.

Identive power is the fundamental striving of all beings for determinateness, for completeness, for an explicit identity. It is thus the will to power. Identive power is the basic, the super ordinate, upward striving to completion labelled variously by psychologists as the drive to power, to self-assertion, to self-esteem, to self-affirmation, to identity. It is that which gives underlying direction to our activities, interests, and goals. It is our future oriented law of movement. In the words of Alfred Adler, Identive power is the capacity of one's being able to produce effects, whether through other selves or through the environment.

4.6.3 Assertive Power

The unintended, active becoming which is natural to all beings is identive power. For us as human beings, however, much of our activity is focused, purposive, intentional. We transform identive power into a means towards the accomplishment of some goal, the gratification of some need, the satisfaction of some interest.

Because the focus here is on social behaviour, one can divide these manifestations of intentional power into three levels: the environment, another's body, and another self.

Turning to the first level, the environment, we have a variety of powers which we often call abilities. Our strength, memory, reason, verbal fluency, numerical fluency, intelligence, and so on are powers through which we manifest our interests.

As we intentionally bring these powers to bear against the environment through our perspective, we are asserting our interests. For this reason, I call this form of power assertive. It is a pushing outward, but not only the essential pushing of all beings, but the thrusting against external powers, a struggle, to manifest one's future goal.

4.6.4 Power and Interests

Intentions are interests being manifested through behaviour, and thus involve three elements: interests, gratification, and will.

Interests are activated attitudes, which in turn are linked to the basic needs. Needs are source of psychological energy driving persons to seek security or sex, to self-assertion or pugnacity, and so on.

As culture becomes more and more complex, and the knowledge and experience increase, one tends to connect these needs and their gratification to an increasing extended attitudinal lattice. Needs become gratified through a variety of attitudes and one attitude may help satisfy more than one need. The attitude thus gives specific direction to our needs. It matches the universal needs to the widely varying complexities of different cultures and to the circumstances of the individual's time and place.

It is within the attitude, the sentiments and roles are located. Sentiments are attitudes sharing the same goal, although they may satisfy different needs. Thus, one finds a clustering of attitudes into the religious, career, sports and games as well as sentiments. Most importantly, one finds the self sentiment and the superego sentiment. The former are "the attitudes centered on the self, which include wanting to control one's mental processes, avoiding damaging self-respect, being first-rate in one's job, having a reputation for honesty and high principles, and to be responsible and in charge of things". On the other hand, the superego sentiment is a cluster of attitudes "centered on being moral, including duty to church and parents, unselfishness, avoiding sexual sin, gambling, and drinking and maintaining good self-control".

Even though attitudes cluster by goal into a specific sentiment, the situations related to these goals may differ. The self sentiment, for example, may involve situations ranging from occupation to games to parent child and husband wife relationships. However, there are attitudes which share both the situation to which they are relevant. A role is a clustering of attitudes that refer to the same situation and that have the same goal. Attitudes subserve the needs, and thus the needs surely form an element in these attitudes. In addition, there are three other elements viz., the integrated self, involving our ego and superego, a physiological-autonomic element, in effect comprising our unconscious id, and our external context, that which we perceive.

Thus we find attitudes as the basic motivational unit, the dispositions defining our needs, goals, sentiments, and roles. Attitudes combine id, ego, and superego and frame our motivational structure. As dispositions, however, attitudes have direction (the goals) but no necessary power to be manifest through behaviour. For example, we may want to eat steak, but that particular attitude may be dormant because we are not hungry. We must bring into the picture the notion of activated attitudes and dormant attitudes, in which the activated need is one that not only has direction but a power to be manifest (to be satisfied). The seat of this power lies in the psychological energy associated with the needs. It is the same in form as identity power, in that it has the capacity to produce effects.

The attitude gives direction to this power which in turn gives attitudes a strength-to-becoming; together they form our interests: our attitudes and their associated power-towards-gratification.

Since attitudes, the basic motivational units, involve both the integrated self ("I") and the goal, the attitude thus defines an intentional disposition.

There are two kinds of motivational powers, the first being a person's interests that are directed by the associated attitudes and given magnitudes by their power toward gratification. The second power corresponds to a person's intention, that

is, it is the resolution of the power of an interest with the power of the will towards its gratification. Thus, assertive power is the conjunction of our interests whose goals focus on the environment, such as learning to swim, pruning flowers, or building a fire, and our will to gratify them.

4.6.5 Force and Physical Power

We satisfy our interests not only against the environment, but against others as well. In understanding power directed intentionally towards others, there is one primary consideration, that is whether the power is directed towards the other self or his body?

Power directed towards another self is oriented towards the other's psychological field, perceptions, motivations, behavioural dispositions, interests or intentions. For instance the advertisements, propaganda, commands, threats, inducements, deception, promises etc. that we make are examples of power directed towards another self.

Power also can be directed to another's body. This distinction between the self and body oriented powers is what divides two healing professions: medicine and psychoanalysis. Medical doctors are concerned with the body's health and so direct their powers towards its well being; psychoanalysts concerned with the self use their powers to help another self integrate and direct its interests and use its own powers.

Power directed intentionally towards another's body is called physical power. There are many kinds of physical powers, of which one, the medical, has already been mentioned. Prostitutes, masseurs, gymnasts, beauticians, and so on are known for their manifestation of particular physical powers. There is a type of physical power which is central to social area, which intentionally and physically affects a person contrary to his will. It is not oriented towards influencing, changing, or altering the person's choice, but to directly opposing it physically. This is called force, which refers to trying to physically effect another's body or interests contrary to that person's intentions. This idea of force uncovers a nest of issues, some of which should be clarified here and the rest in conjunction with the discussion of social power.

Now, to use force means is to use physical power to overcome the resistance of another's will. Thus, a holdup is not force, but if the person hits you over the head and takes your money in spite of your willful opposition, that is force. The second is between coercing a person's will or physically overcoming it. Everyone can be forced against their will. They can be tied up, knocked unconscious, carried off to jail, regardless of their will's opposition. But no one can be forced to do something against his will. He can only be coerced.

4.7 FAMILY POWER

Family power is important to those who want to understand how families function as a unit to make decisions about how to manage money, about where to live, about occupational and educational choices, about parenting practices, about where to go on a vacation, and so on. Family scientists define power in terms of who is able to influence others to get their way in the family, and who is able to

block others from getting their way. In most cases, family power is a property of the family system, not of a single individual, because it is almost impossible for one individual to have their way all of the time. Although the rules that govern power in a particular family may evolve as children are born, grow up, and move out, as the marital relationship changes or dissolves, or as the circumstances of the family changes, power is deemed to be fairly predictable within these stages. This predictability can be a comfort to those family members who are happy with the power arrangements or a matter of disdain, perhaps even a matter of personal health and safety, for those who find themselves dominated by others. Family power has been classified into three areas , viz., power bases, power processes, and power outcomes.

Power Bases

There are six bases of family power.

1) Legitimate power is sanctioned by the belief system within the family, such as the belief that the husband should be the head of the household, that parents should have control over raising small children, or that adolescents should have control over what they wear.

2) Informational power has its foundation in specific knowledge that is not available or is unknown to others in the family and in one's ability to verbally present the pertinent information in a persuasive way. For example, if the man in the household is the only one who knows his income, or if he is viewed as knowledgeable about money, then he is likely to make decisions about how money is spent in the family.

3) Referential power is based on affection, mutual attraction, friendship, and likeability within the family. Positive feelings can be a powerful force in making alliances with others, if others want to make those they care about happy and, conversely, not to disappoint them. A parent's desire to please a favored child, a husband's desire to please his wife, a child's desire to please a grandparent are examples of referential power.

4) Coercive power involves the use of physical or psychological force in imposing one's way on others in the family, assuming that others are resistant or opposed. Parental discipline, threats, aggression, conflict, and competition are inherent in the use of coercive power because getting one's way is usually realised at the expense of others getting theirs. An example of coercive power can be seen when a parent forces a child to attend a school or college he or she does not wish to attend by threatening to withdraw the child's support.

5) Expert power is based on education, training, or experience that is relevant to the issue at hand. For example, if the woman of the household is a licensed real estate agent, she may have the most influence on where the family lives.

6) Reward power is the ability to influence others by providing physical and psychological benefits to those who comply with one's wishes. With small children, parents often influence behaviour with candy or sweets. With older children and adolescents, the price of power might be more expensive. Adults in families often strike bargains, exchange pleasing behaviours, and "sweet talk" others to get their way.

The resource theory of family power was influential because the idea suggested that men do not become heads of households by divine right or natural biological processes, but because they have more and easier access to educational, financial, and occupational resources in society.

Power Processes

An examination of power processes reveals that getting one's way in the dynamic interaction of families entails an ongoing set of complex and subtle maneuvers involving communication, commitment, bargaining and negotiation, coalition formation, conflict and conflict resolution, and parenting styles. Moreover, an examination of power processes reveals that in virtually all cultures, variables like the number of children and where the family lives make family power processes more complex.

Willard Waller (1938) is credited with first articulating the idea that family power is sometimes affected by commitment: The principle of least interest states that in disputes involving power, the individual who is least interested in continuing the relationship usually has more power than the one who is more interested in continuing the relationship.

The authoritative style of parenting combined with a balance of parental control and parental warmth and support. Authoritative parents set limits on acceptable behaviour in children, yet do so in an affectionate environment that encourages autonomy, values expression of opinions, and encourages participation in family decision-making.

Power Outcomes

Power is an underlying dimension of every family relationship and virtually every family activity, and its importance lies in the fact that having a sense of control over one's life is necessary for the health and happiness of humans, including children, adults, and the elderly. In the studies already discussed, it is evident that power should be fairly apportioned to every family member, from the youngest infant to the most elderly person. If every member of a family has a sense of personal control, balanced with family control, the family can be a source of power and strength through its guidance, support, and care. When someone in the family abuses power, however, the damage to trust, loyalty, and freedom can have long-term negative effects for everyone in the family.

The variation in parental practices—the do's and don'ts of raising children—from society to society is astounding. For example, it may be difficult to understand why Turkish mothers keep their babies restrictively swaddled for several months following birth (to show that the baby is covered with care). It may seem odd, if enticing, that Beng mothers paint pretty designs on the faces of their infants every day (to protect the baby against sickness). Should parents clean and bathe children? That, according to the childcare guides, depends on what society the child is born into. Although parenting practices vary around the world, one principle underlies all cultural variations. In no extant culture are mothers or fathers legitimately granted absolute power to mistreat their children. There is a general ethical principle that is universal: the abuse of power in families is not socially condoned.

As mentioned earlier, power has many bases, such as threats, promises, or love, and many forms. It is found useful to discriminate the following. Power is the capacity to produce effects (e.g., as does the wind).

Identive power is the capacity of one's being to produce effects (e.g., unconsciously, while walking, causing birds to take flight)

Assertive power: the capacity to produce intentionally effects on one's environment (e.g., digging a hole in the ground).

Physical power: the capacity to effect intentionally another's body (e.g., surgery). Force: the capacity to effect intentionally another's body or interests against the other's will (e.g., knocking a person unconscious and taking their money)

Social power: a capacity to produce effects through another self (e.g., a politician getting others to vote for him).

Coercive power: a capability to threaten a person into choosing one undesirable behaviour over another (e.g., "Either be tortured or confess.").

Bargaining power: a capability to use promises to entice a person into choosing one desirable behaviour over another (e.g., "I'll give you Rs. 500 for the radio and no more". Implicit is the understanding that the person wants to keep his radio and would also like to keep back Rs.500/- so now must choose between these desirables).

Intellectual power: a capability to persuade a person into believing or doing something (e.g., "You're right. I should take vitamin E).

Authoritative power: a capability to use legitimacy to convince a person to do something (e.g., teacher: "Your homework assignment is . . . .").

Altruistic power: a capability to use love to induce a person into doing something (e.g., "Honey, would you do this for me?").

Manipulative power: a capability to control the situation and opportunities of a person to cause him to do (be) something (e.g., enrolling one's child in a expensive private school).

Distinction between exercising and having power

If a person has power and uses the power to make others do something etc.,then we could say that the person can exercise power and is likely to be successful in doing so. Our basis for this is an assessment of the person's resources. He may have wealth, prestige, or a high government position. Or he may be strong in body, charming, intelligent, or have special expertise. In any case, we perceive the other as having the resources to threaten, to promise, to force, to manipulate, and so on, which, compared to others, enable him to do so successfully, that is to succeed in using power. Thus, the distinction between exercising and having power is a distinction between the capability to exercise power and the resources to be successful at it.

In summary, power has been defined as a capability to produce effects and described a number of its forms. These forms depend on whether power is:

1) intentionally directed or not;
2) oriented towards the environment, another's body, or another self;
3) against another's will or not (force or not);
4) directed towards manifesting another's negative or positive interests;
5) based on threats, promises, persuasion, love, legitimacy, or controlling the situation and opportunities.

In addition, we should distinguish between having and exercising power. The former is having the resources for the likely successful manifestation of power; the latter is the actual use of power.

4.8 LET US SUM UP

Social conflict is exclusively an aspect of social power. To understand social conflict we must deal at the level of social powers and their related factors. When two persons or more than two persons clash with each other verbally or physically, there is a conflict and in a social situation it turns out to be a social conflict. The social conflict cannot be understood without taking into consideration the social power as most of the conflicts that emerge in a social situation is related to the power one has and the power one is able to wield. In this unit we learnt about the above factors, in addition to the nature of social power and family power and how these affect individual's behaviours.

Defining Conflict, we pointed out that it is the confrontation of powers. But power takes many forms. Power can be identified. It can be assertive, altruistic and manipulative, coercive and physical, and so on. Some powers are intentionally directed, as are assertive and bargaining powers; Some powers are directed wholly towards a person's body, as is a blow to the body or application of force to make the person submit.

The social conflict means intentionally taking into account other persons ion the environment or in the society. In social conflict the persons concerned use power to produce effects, and social power is an intentionally directed measure to produce effects on the other person or through another person. Social conflict is then the confrontation of social powers.

In order to understand power, coercive power and social conflit we need to know about violence and how far it is the same as coercive power. We learnt in this unit that Violence directed towards coercing another's will comprise either a threat or deprivation, and is an indication of the application of coercive power.

We discussed the many ways of resolving conflicts besides exchange and coercion. However, for one reason or another these may be undesirable or unworkable. One can then abdicate the interest. If success does not seem worth the cost, x may be left to the other person.

Social power refers to the capacity to produce effects, that is using that power one should be able to make another person or persons to do what you desire. There are two factors involved in social power to have its effects, viz. the intentionality and orientation towards another person's self, apart from their body.

Social power has different forms and these include coercive power, bargaining power, and power as a status. Under essence of power we discussed power as a concept basic to understanding a reality of potentialities and actualities. Power was discussed in terms of relative and absolute. We defined identive power, assertive power and pointed out as to how power and interests are inter related.

Family power was considered in terms of its importance and family and the various subdivisions of family power were listed out. To sum up one can state that power has been defined as a capability to produce effects and described a number of its forms. These forms depend on whether power is (1) intentionally directed or not; (2) oriented towards the environment, another's body, or another self; (3) against another's will or not (force or not); (4) directed towards manifesting another's negative or positive interests; (5) based on threats, promises, persuasion, love, legitimacy, or controlling the situation and opportunities.

4.9 UNIT END QUESTIONS

1) Discuss the conflict in socio cultural field citing the current Indian researchers.
2) Explain what are the elements and processes of social conflict in group life.
3) Describe the nature of power and its various dimensions.
4) Critically elaborate the role of family power in social behaviour.

4.10 SUGGESTED READINGS

Louis Cohen (2007), *Research Method*, 2 Park Square, MIlion Park, Abingdon, Oson Ox14 4RN, Routledge, Sixth Edition.

S.S. Chouhan (1978), *Advanced Educational Psychology*, Vikas Publishing House Pvt. Ltd. Banglore (1997), Sixth Edition.