

M.A. (Education)
FIRST YEAR
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**INSTITUTE
OF DISTANCE
EDUCATION** **IDE**
Rajiv Gandhi University

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PSYCHOLOGY OF LEARNING AND DEVELOPMENT

PSYCHOLOGY OF LEARNING AND DEVELOPMENT

MA [Education]

First Year

MAEDN 402



RAJIV GANDHI UNIVERSITY

Arunachal Pradesh, INDIA - 791 112

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About the University

Rajiv Gandhi University (formerly Arunachal University) is a premier institution for higher education in the state of Arunachal Pradesh and has completed twenty-five years of its existence. Late Smt. Indira Gandhi, the then Prime Minister of India, laid the foundation stone of the university on 4th February, 1984 at Rono Hills, where the present campus is located.

Ever since its inception, the university has been trying to achieve excellence and fulfill the objectives as envisaged in the University Act. The university received academic recognition under Section 2(f) from the University Grants Commission on 28th March, 1985 and started functioning from 1st April, 1985. It got financial recognition under section 12-B of the UGC on 25th March, 1994. Since then Rajiv Gandhi University, (then Arunachal University) has carved a niche for itself in the educational scenario of the country following its selection as a University with potential for excellence by a high-level expert committee of the University Grants Commission from among universities in India.

The University was converted into a Central University with effect from 9th April, 2007 as per notification of the Ministry of Human Resource Development, Government of India.

The University is located atop Rono Hills on a picturesque tableland of 302 acres overlooking the river Dikrong. It is 6.5 km from the National Highway 52-A and 25 km from Itanagar, the State capital. The campus is linked with the National Highway by the Dikrong bridge.

The teaching and research programmes of the University are designed with a view to play a positive role in the socio-economic and cultural development of the State. The University offers Undergraduate, Post-graduate, M.Phil and Ph.D. programmes. The Department of Education also offers the B.Ed. programme.

There are fifteen colleges affiliated to the University. The University has been extending educational facilities to students from the neighbouring states, particularly Assam. The strength of students in different departments of the University and in affiliated colleges has been steadily increasing.

The faculty members have been actively engaged in research activities with financial support from UGC and other funding agencies. Since inception, a number of proposals on research projects have been sanctioned by various funding agencies to the University. Various departments have organized numerous seminars, workshops and conferences. Many faculty members have participated in national and international conferences and seminars held within the country and abroad. Eminent scholars and distinguished personalities have visited the University and delivered lectures on various disciplines.

The academic year 2000-2001 was a year of consolidation for the University. The switch over from the annual to the semester system took off smoothly and the performance of the students registered a marked improvement. Various syllabi designed by Boards of Post-graduate Studies (BPGS) have been implemented. VSAT facility installed by the ERNET India, New Delhi under the UGC-Infonet program, provides Internet access.

In spite of infrastructural constraints, the University has been maintaining its academic excellence. The University has strictly adhered to the academic calendar, conducted the examinations and declared the results on time. The students from the University have found placements not only in State and Central Government services, but also in various institutions, industries and organizations. Many students have emerged successful in the National Eligibility Test (NET).

Since inception, the University has made significant progress in teaching, research, innovations in curriculum development and developing infrastructure.

About IDE

The formal system of higher education in our country is facing the problems of access, limitation of seats, lack of facilities and infrastructure. Academicians from various disciplines opine that it is learning which is more important and not the channel of education. The education through distance mode is an alternative mode of imparting instruction to overcome the problems of access, infrastructure and socio-economic barriers. This will meet the demand for qualitative higher education of millions of people who cannot get admission in the regular system and wish to pursue their education. It also helps interested employed and unemployed men and women to continue with their higher education. Distance education is a distinct approach to impart education to learners who remained away in the space and/or time from the teachers and teaching institutions on account of economic, social and other considerations. Our main aim is to provide higher education opportunities to those who are unable to join regular academic and vocational education programmes in the affiliated colleges of the University and make higher education reach to the doorsteps in rural and geographically remote areas of Arunachal Pradesh in particular and North-eastern part of India in general. In 2008, the Centre for Distance Education has been renamed as "Institute of Distance Education (IDE)."

Continuing the endeavor to expand the learning opportunities for distant learners, IDE has introduced Post Graduate Courses in 5 subjects (Education, English, Hindi, History and Political Science) from the Academic Session 2013-14.

The Institute of Distance Education is housed in the Physical Sciences Faculty Building (first floor) next to the University Library. The University campus is 6 kms from NERIST point on National Highway 52A. The University buses ply to NERIST point regularly.

Outstanding Features of Institute of Distance Education:

(i) At Par with Regular Mode

Eligibility requirements, curricular content, mode of examination and the award of degrees are on par with the colleges affiliated to the Rajiv Gandhi University and the Department(s) of the University.

(ii) Self-Instructional Study Material (SISM)

The students are provided SISM prepared by the Institute and approved by Distance Education Council (DEC), New Delhi. This will be provided at the time of admission at the IDE or its Study Centres. SISM is provided only in English except Hindi subject.

(iii) Contact and Counselling Programme (CCP)

The course curriculum of every programme involves counselling in the form of personal contact programme of duration of approximately 7-15 days. The CCP shall not be compulsory for BA. However for professional courses and MA the attendance in CCP will be mandatory.

(iv) Field Training and Project

For professional course(s) there shall be provision of field training and project writing in the concerned subject.

(v) Medium of Instruction and Examination

The medium of instruction and examination will be English for all the subjects except for those subjects where the learners will need to write in the respective languages.

(vi) Subject/Counselling Coordinators

For developing study material, the IDE appoints subject coordinators from within and outside the University. In order to run the PCCP effectively Counselling Coordinators are engaged from the Departments of the University. The Counselling-Coordinators do necessary coordination for involving resource persons for contact and counselling programme and assignment evaluation. The learners can also contact them for clarifying their difficulties in their respective subjects.

SYLLABI-BOOK MAPPING TABLE

Psychology of Learning and Development

Syllabi	Mapping in Book
PART A. THEORY	
UNIT-I Psychology and Education	
- Nature, Scope and concept of educational psychology	Unit 1: Psychology and Education (Pages 5-24)
- Schools of psychology and their contributions to Education; Structuralism	
- Functionalism Gestalt, Constructivism	
UNIT-II Methods of Educational Psychology	
- Experimental Method	Unit 2: Methods of Educational Psychology (Pages 25-44)
- Differential Method	
- Clinical Method Observation Method	
UNIT-III Growth and Development	
- Dimensions of growth and development; Physical, Social, Emotional, Language development with special reference to Adolescence period	Unit 3: Growth and Development (Pages 45-84)
- Factors of growth and development: Heredity and environment and their implication on education	
- Developmental task during Adolescence period	
UNIT-IV Theories of Learning and Motivation	
- Learning: Concept and principles of learning	Unit 4: Theories of Learning and Motivation (Pages 85-123)
- Theories of learning, Kurt Lewin's field theory, Tolman's sign theory	
- Bruner's concept attainment theory, Hulls reinforcement theory, Gagne's hierarchy of learning.	
- Meaning, kinds and importance of motivation in learning	
- Theories of motivation (Maslow's self-actualisation and Achievement motivation)	
- Transfer of learning and its theories	
UNIT-V Intelligence	
- Concept Nature and Types of intelligence	Unit 5: Intelligence (Pages 125-157)
- Theories of intelligence (Thurstone, Guilford and Piaget)	
- Emotional Intelligence: Concept and Theory	
- Multiple Intelligence: Concept and Theory	
- Measurement of Intelligence.	
UNIT-VI Personality and Mental health	
- Meaning, Nature and determinants of personality	Unit 6: Personality and Mental Health (Pages 159-193)
- Theories of personality (Psychoanalytical Type and Trait approaches)	
- Mental health.	
- Personality and Mental health	
- Inclusive Education.	

PART B. PRACTICAL

UNIT- VII Test Administration and Interpretation

- Performance Test of intelligence
- Aptitude Test
- Personality Test/Questionnaire
- Attitude Scale

Unit 7: Test Administration
and Interpretation
(Pages 197-220)

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INTRODUCTION

Introduction

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No teacher can teach effectively without trying to understand the psychology of proper instruction. Each student has an individual set of characteristics that influence his ability to comprehend, register and process information. Also, the effectiveness of teaching is influenced by the assessment techniques and the school's overall environment, rules and attitude with regard to tests. The style and method used to teach are greatly affected by the background and experience of the teacher. The manner of teaching, in turn, greatly influences the way the student is shaped and prepared to take on future challenges.

This book, *Psychology of Learning and Development*, deals with all the psychological aspects of teaching. It discusses the biological, behavioural, cognitive, humanistic and psychoanalytical schools of psychology. The book also throws light on the importance of educational psychology. It, in general, discusses the general principles of growth and development, the stages of development, the theories of child development and the dimensions of adolescent development. Cognitive development and the cognitive process have been discussed with emphasis on attention, inattention, distraction and sensation. Thorndike's laws and the theories of learning, factors influencing the process of learning, the learning curve, theories of intelligence, multiple intelligence, Guilford's structure of the intellect and emotional intelligence are some other important topics covered in this book. The book also discusses the theories of personality, along with the concepts of mental health, conflict, frustration, adjustment and defence mechanisms in detail.

The book has been divided into eight units:

- Unit 1 Psychology and Education
- Unit 2 Methods of Educational Psychology
- Unit 3 Growth and Development
- Unit 4 Theories of Learning and Motivation
- Unit 5 Intelligence
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PART A: THEORY

UNIT 1 PSYCHOLOGY AND EDUCATION

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1.0 INTRODUCTION

Educational psychology involves the study of how people learn, including concepts such as student outcomes, instructional process, individual differences in learning and learning disabilities. Educational Psychology is one of the many branches of psychology dealing mainly with the problems, processes and products of education.

It is an attempt to apply the knowledge of psychology in the field of education. In this we try to study human behaviour, particularly the behaviour of the learner in relation to his/her educational environment. This branch of psychology involves not just the learning process of early childhood and adolescence, but includes the social, emotional and cognitive processes that are involved in learning throughout the entire lifespan. The field of educational psychology incorporates a number of other disciplines, including development at psychology, behavioural psychology and cognitive psychology. In other words, educational psychology may be defined as that branch of psychology that studies the behaviour of the learner in relation to his educational needs and his environment. Educational psychology has been defined by various psychologists and scholars.

In this unit, we will be discussing the nature, scope and concept of educational psychology and about the different schools of psychology and their contribution in the field of education.

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1.1 UNIT OBJECTIVES

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

- Discuss the meaning, nature and scope of psychology
- Describe the features of different schools of psychology and the various methods of psychology
- Identify the various branches of psychology
- Discuss the meaning and importance of educational psychology

1.2 CONCEPTS, DEFINITIONS AND NATURE OF PSYCHOLOGY

Psychology is derived from Greek words 'psyche' and 'logia' which together imply the 'study of the human mind'. Like many other subjects, psychology finds its roots in ancient philosophy. Its subject matter has evolved from the study of soul and mind.

Psychology is now identified as the scientific study of human and animal behaviour. Behaviour is the way one acts in a given situation. Behaviour includes the actual actions and responses of organisms, both animals and human beings. According to Woodworth, 'any manifestation of life is activity and behaviour is a collective name for all these activities'. Total behaviour includes both covert and overt activities. 'Overt behaviour' is that behaviour which can be observed and measured, and 'covert behaviour' is that behaviour which includes our inner experiences and those mental activities that are going on in the brain.

Definitions of Psychology

Important definitions of psychology are as follows:

- **John. B. Watson:** 'Psychology is that division of natural science which has human behaviour—the doing and saying, both learned and unlearned—as its subject matter.'
- **William James:** 'Psychology is the science of mental life, both of its phenomenon and of their conditions.... The phenomena are such things as we call feelings desires, cognitions, reasonings, decision and the like.'
- **Kenneth Clark and George Miller:** 'Psychology is usually defined as the scientific study of behaviour. Its subject matter includes behavioural processes that are observable such as gestures, speech and physiological changes and processes that can only be inferred such as thoughts and dreams.'
- **R.S Woodworth:** 'Psychology is the scientific study of the activities of the individual in relation to his environment.'
- **R.H. Thouless:** 'Psychology is the positive science of experience and behaviour.'
- **Jalota:** 'Psychology is defined as the study of mental processes as experienced in bodily behaviour or observed in direct behaviour.'
- **Gardener Murphy:** 'Psychology is the science that studies the responses which living individuals make to their environment.'

Nature of Psychology

Psychology has certain characteristics which make it a science. These characteristics are as follows:

- **Psychology uses scientific methods:** Psychologists conduct experiments in strictly controlled conditions. Psychological laboratories are used to observe any phenomenon to establish cause-and-effect relationship.
- **Psychology is factual:** It is not based on values but facts. Psychological information is based on observations and experiments.
- **Psychology is verifiable:** Most of the psychological principles can be verified by researchers by using scientific methods.
- **Cause-Effect relationship:** It is the characteristic of science to establish cause-effect relationship and derive universal principles for generalization. Psychology also tries to develop cause-and-effect relationship between different variables under study, and then formulate theories based on the findings.
- **Laws of psychology are universal:** The laws of psychology are considered to be universal in their application. These laws are applicable to all organisms at all times under similar conditions.
- **Psychology can predict human behaviour:** By discovering the cause-effect relationship, psychologists can predict human behaviour. Many psychological tests are conducted to predict the behaviour.

1.3 SCOPE, BRANCHES AND APPLICATIONS OF PSYCHOLOGY

Psychology has mainly been interpreted as 'the study of behaviour' for centuries, but scholars are interested in knowing what are the various fields which psychologists like to explore. Some of these areas are as follows:

- **Physiological psychologists:** Physiological psychology is that science which studies the biological bases of behaviour. Physiological psychologists want to explore the relationship between body processes and behaviour. For example, what is the effect of certain drugs on memory?
- **Developmental psychologists:** Developmental psychologists can study human growth, they lay stress on factors that shape human behaviour from birth to old age. Psychologists try to study how development occurs when there is a gradual accumulation of knowledge.
- **Experimental psychologists:** Experimental psychologists use experimental method to study behaviour. Experimental psychology involves the collection of reliable and quantifiable behavioural data.
- **Clinical and counselling psychologists:** Clinical and counselling psychologists deal with diagnosis and treatment of mental and emotional problems like drug addiction, juvenile delinquency, and criminal behaviour.
- **Industrial psychologists:** Industrial psychologists are broadly concerned with human factors in industry. They try to improve quality of work life by addressing issues like justice at workplace, balancing roles at work and at home.

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- **Personality and social psychologists:** Social psychologists are concerned with the behaviour of people in groups. Personality and social psychology emphasizes to concentrate on basic questions regarding people and their sensations, perceptions and attitude.

Social psychologists use scientific methods to analyse social interactions and how thoughts, feelings, and behaviours of individuals are influenced by other people.

- **School and educational psychologists:** These days most of the schools offer students the facilities of a trained educational psychologist because the adolescents come across many types of emotional and career problems during this phase of their life.

1.3.1 Branches of Psychology

There are many branches of psychology such as:

- **General Psychology:** This branch of psychology deals with theories and principles related to the behaviour of normal human beings. General psychology studies different aspects of mind as perception, cognition, emotion, and behaviour.
- **Abnormal Psychology:** The subject matter of this branch of psychology is the study of various forms of abnormal behaviour, and its treatment through various psychological techniques. Abnormal psychology is scientific study of many psychological disorders.
- **Child Psychology:** This branch of psychology studies the growth and development of a child from birth to adolescence. It studies the behaviour of children with special needs. Child psychologists deal with knowledge on development of child which includes physical, mental and emotional growth.
- **Animal Psychology:** In this branch of psychology, the animal behaviour is studied under controlled conditions.
- **Environmental Psychology:** This branch of psychology refers to role of environment on behaviour. The psychologists lay emphasis on modifying and restructuring environment for social well-being.
- **Sports Psychology:** This branch of psychology studies the behaviour of players and sport persons. The main aim of sports psychologists is to improve the performance of players by minimizing the psychological effects of injury and poor performance and by managing their emotions.
- **Aerospace Psychology:** Aerospace psychology deals with the behaviour of astronauts who go to space. Aerospace psychologists try to design training programmes for the astronauts so that they can adapt their behaviour according to the new environmental settings and are in sound mental health.
- **Military Psychology:** This branch of psychology is related to the behaviour of soldiers working in the armed forces. The main area of concern for the military psychologists is how the stress level of the soldiers can be reduced and their morale can be kept high.
- **Consumer Psychology:** This branch of psychology deals with the behaviour of consumers in their present economic situation and social status. The area of interest is to find out the needs of the customers and their expectations from the product. This branch of psychology is designed to benefit the sales persons.

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- **Psychometrics:** This branch of psychology is concerned with the construction of psychological tests for measuring and analysing different aspects of behaviour.
- **Folk Psychology:** It is the branch of psychology which aims to study the culture, art, religion, superstitions and other such aspects. This branch of psychology is gaining more prominence in the developed countries.
- **Organizational and Managerial Psychology:** This branch of psychology studies the behaviour of human resources in the organization. By studying this branch, psychologists can help the managers working in the organizations in maintaining their zeal and enthusiasm for exercising their duties properly, and cooperatively by seeking proper satisfaction and adjustment in their work environment.

1.3.2 Relationship of Psychology with Other Fields of Study

The relationship of psychology with other fields of study may be discussed under the following heads:

- **Psychology and economics:** Economics is the study of man's activities devoted to obtaining the material means for satisfaction of his wants. Thus, it can easily be concluded from the above definitions that economics studies some activities of human beings; on the other hand, psychology also studies human activities. Many economic problems have a psychological aspect, for example, problems of strikes, lockouts, advertisements and propaganda, working conditions can be solved by psychological interventions. Principles of demand and supply and law of marginal utility are also related to human interactions which form an important part of psychology.
- **Psychology and political science:** Political science studies political institutions, working of government laws, etc. Social psychology studies the behaviour of individuals in society. Political science studies the laws formed for the people living in the society. The laws cannot be made without understanding the psychology of people.
- **Psychology and sociology:** Sociology is scientific study of society. Sociology studies man in the context of society and as a part of it. According to MacIver, sociology gives aid to psychology. In order to understand group behaviour in sociology, it is important to study individual behaviour.
- **Psychology and biology:** Behaviour is related to man's interaction with environment. Darwin's theory of evolution is based on biological theories. Behaviour is related to external as well as internal feelings. The human behaviour and animal behaviour cannot be explained without the help of biological principles.
- **Psychology and philosophy:** History of psychology reveals that psychology was considered the study of mind. Mind is a philosophical term. Mental concepts like deep sleep, dreams are all a part of philosophical discussions, but its logical explanations are based on the psychological theories given by Freud.

1.3.3 Applications of Psychology

Applications of psychology include several important areas, such as:

- **Education:** Psychology has a very important role to play in the field of education. Psychologists work in schools and universities to guide students in their

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educational and vocational problems. They also work to solve problems of adjustment. Conducting aptitude, intelligence and personality tests is a part of their counselling sessions.

The psychologists working in schools also help teachers in developing skills in solving classroom problems and develop and improve teaching methods to increase class effectiveness.

Some students are unique and require special teaching assistance. Psychologists also help in designing programmes for such special children.

- **Criminology:** Forensic psychology deals with a lot of practices that mostly include medical evaluations of defendants, statements given to judges, and courtroom testimony. Rehabilitation of criminals also involves psychologists.
- **Therapy:** Psychology has been proved to be very useful in treatment of diseases. The cause of many diseases is psychological, and hence requires psychological treatment. It has been found by many studies that 10 per cent of the American population at one time or another suffer from some mental problem.

It is commonly said that every human being at some point of time requires the guidance of a clinical psychologist. Psychologists conduct many types of therapeutic sessions on the patients suffering from psychological problems like neurosis, anxiety and phobia. This branch of psychology is called 'abnormal psychology'.

- **Trade:** One important area related to industry is advertisement. Psychology has made selling an art. Psychologists understand the interest and perception of customers and help in creating the advertisements, while keeping in mind the needs of buyers.

- **Recruitment:** Psychology has helped the organizations in finding out suitable men for different kinds of work. Psychologists are also a part of interview boards to judge the different aspects of the personality of the candidates appearing for the interview.

- **Self-understanding:** Psychology helps in understanding the self—the more you know, and find out about yourself, your personality and your faults; the more are the chances of self improvement. Self-understanding is the way to self control, and thus a person becomes more self-confident. Understanding hidden self, unconscious part of personality, Freud's analysis of dreams is another important contribution of psychologists in this direction.

- **Politics:** Psychology has been widely used in political science. It has become very important for the politicians to understand the psychology of public to remain in power. Leadership is also very crucial discipline of psychology. Various theories and practices of leaders are discussed in psychology.

- **Communication:** Psychology not only helps in improving communication skills but also improves relationship by understanding others. Psychology also emphasizes the importance of non-verbal communication by understanding gestures, posture and body language to communicate better.

- **Military science:** Psychology helps in selection, training, promotion and classification of military personnel. Psychology also helps in knowing the current level of mental status. It also tries to bring modifications and corrections in the environmental situations and work conditions of the defence personnel after analysing the needs.

Psychology also helps in the time of war by designing techniques to keep the morale of the soldiers high. Psychologists also try to make the defence personnel capable of handling the stress.

- **World peace and brotherhood:** The reasons for war, conflict and fights is that the people fail to understand the behaviour of other people. Psychology helps in understanding the different aspects of behaviour, and analyse the causes of different types of peculiar behaviour and the situations that lead to this behaviour. Psychological techniques can also be helpful in building mutual trust and a feeling of brotherhood.

1.3.4 Scope of Educational Psychology

Educational psychology is the application of psychological findings in the field of education. It is the systematic study of the development of the individual within the educational settings. Educational psychology helps the teacher to transform a student into a responsible and participating citizen; a sensitive and reflective human being; and a productive and creative person.

Caroll (1965) defined educational psychology as 'the study of school learning in all its aspects'. Klousmier *et al.*, (1975) suggest that it is the science that studies the student behaviour in educational settings. Student behaviour and the educational process set the boundaries of its content and methodology. Gage (1967) opined that educational psychology should deal with the psychology of different methods of teaching, characteristics of learners and the conduct of teachers.

Judd describes educational psychology as 'a scientific study of the life stages in the development of an individual from the time he is born until he becomes an adult'.

Educational psychology is applied to the educative process from birth to death of an individual. Lindgren (1976) has pointed out that there are three elements or focal areas in education that concern educational psychologists and teachers. These are as follows:

- The Learner:** The learner is the most important of the three elements, not only because people are more important than processes or situations, but primarily because without the learner, there is no learning. A great deal of what happens in the classroom (or is expected to happen) can be explained in terms of the personalities of students, individual differences, developmental characteristics, mental health, intelligence and psychological problems of students.
- The Learning Process:** By learning process, we mean whatever people do when they learn. What they 'do' includes behaviour that is not directly observable, such as perceiving, thinking, remembering and identifying; as well as the behaviour that can be directly observed, such as writing, computing, attending and talking.
- The Learning Situation:** It refers to the environment in which the learner finds himself/herself, and in which the learning process takes place. It includes factors or conditions that affect the learner and the learning process. The teacher is one element and another is the classroom setting (ventilation, light, noise and arrangement of seats, etc.).

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1.3.5 Importance of Educational Psychology for the Teacher

Educational psychology helps the teacher in the following ways:

Contributions to theory of education

- *Better understanding of developmental characteristics:* Children pass through different stages of development, such as infancy, childhood and adolescence. These developmental stages have their own characteristics. If the prospective teacher knows the characteristics of learners emerging at different stages of development, he/she can utilize these characteristics in imparting instructions and moulding their behaviour according to the specified goals of education.
- *Knowledge of the nature of classroom learning:* The knowledge of educational psychology provides a teacher the knowledge of learning process in general and problems of classroom learning in particular. It also helps in developing a comprehensive theory of classroom learning. We know from our daily experience in schools that some teachers are successful in the classroom than others. Some communicate very effectively in the class to students and some fail irrespective of their knowledge of the subject matter. What makes this difference? Definitely to be successful in the class, a teacher must know something other than the subject matter. It is the knowledge of science of behaviour which makes the difference. He/She must understand the students whom he/she teaches, their developmental characteristics, their abilities and the influence, and the contribution of heredity and environment in the process of an individual's personality development.
- *Better understanding individual differences:* No two individuals are alike in the world. The teacher has to face a class of 30 to 50 students who have a great range of individual differences. The teacher with the help of the knowledge of the kind of individual differences may adjust his/her teaching to the needs and requirements of the class.
- *Knowledge of effective teaching methods:* Everyday experience shows that the lack of proper methods of teaching sometimes results in failure of communication in the classroom. Educational psychology gives us the knowledge of appropriate methods of teaching. It helps in developing new strategies of teaching. Valid psychological principles not only suggest new techniques of teaching-learning, but also eliminate many traditional practices that have become obsolete in the present context.
- *Better understanding of problems of children:* By studying educational psychology, a teacher may understand the causes of the problems of children, which occur at different age levels, and can successfully solve them. There is a great difference in the method of solving problems of children by a trained teacher and an untrained teacher.
- *Knowledge of mental health:* Mental health of the teacher and the taught is very important for effective teaching-learning process. The teacher from the study of psychology can know the various factors which are responsible for the mental ill-health and maladjustment. He/She can be very helpful to prevent maladjustment in children provided that the prospective teacher is equipped with the fundamental knowledge of mental hygiene.
- *Curriculum construction:* Psychological principles are also used in formulating curriculum for different stages. Needs of the students, their developmental

characteristics, learning pattern and needs of the society, all these are to be incorporated in the curriculum. The curriculum in recent years includes the needs of the individual and society so that maximum transfer may occur from school to social situations.

- *Measurement of learning outcome:* Psychological tools help the teacher to assess the learning outcomes of the students. He/She can also evaluate his/her teaching methods; and in the light of the performance of his/her students, he/she can modify his/her strategy of teaching.
- *Research:* Educational psychology helps in developing tools and devices for the measurement of various variables which influence the behaviour and performance of students. Teachers can control, direct and predict the behaviour of students on the basis of research studies in classroom teaching.
- *Guidance for the education of exceptional children:* The most important single contribution of educational psychology is the provision and organization of education for the exceptional children who had been neglected and devoid of educational facilities.
- *Development of positive attitude:* If we examine the activities and curriculum of a training college, we find that teachers' training programme aims to develop positive attitudes towards teaching profession and provide the prospective teachers with the necessary competencies to meet the classroom challenges. They develop confidence in trainees to face the problems and adaptability to deal with unexpected problems in daily classroom teaching.
- *Understanding of group dynamics:* In recent years, educational psychologists have recognized the importance of social behaviour and group dynamics in classroom teaching-learning. The teacher must know about the operations which work in total social environment and their effect on learning.

So far we have mainly concentrated on the theoretical side of the contribution of educational psychology to education. It has also influenced the practical aspect of education.

Contribution to practice of education

- *Problem of discipline:* 'Spare the rod and spoil the child' was the slogan of traditional teachers who tackled the problems of indiscipline by dint of corporal punishment. Now teachers who have the knowledge of modern educational psychology realize that the use of corporal punishment is inhumane. They have changed their attitude from an autocrat to a democrat.
- *Use of audio-visual aids:* Before Independence, the teachers hardly made use of audio-visual aids in their teaching. Rote memorization was the only method of learning. It has been experimentally proved now that the use of audio-visual aids makes the difficult concept more clear and definite and learning is more lasting. It is the contribution of educational psychology that teachers make use of various types of audio-visual aids in classroom teaching.
- *Democratic administration:* Former autocratic methods of administration in school and classroom have been changed by a democratic way of life. Both administrators and teachers are democratic, cooperative and sympathetic. Problems of administration are now solved by mutual discussion among the various agents of school.

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- **Time table:** There was a time when arithmetic and geometry were taught from morning till evening. No consideration was given to the principles of psychology. Now subjects are kept in the time table keeping into consideration their difficulty level and fatigue index. No two difficult subjects are taught in successive periods.
- **Co-curricular activities:** Earlier, teachers used to give undue importance to the theoretical subjects in schools. Activities like debate, drama, scouting and games were supposed to be a wastage of time. Now we give these activities due importance for the harmonious development of the personality of children.
- **Use of innovations:** Several innovative ideas have been introduced to improve the teaching-learning process. Activity-centred teaching, discussion method, micro-teaching, programmed instruction, and non-graded school classes at the primary stage are some of the important innovations.
- **Production of textbooks:** Educational psychology has helped the planning of textbooks. We now write textbooks keeping into consideration the intellectual development of children, needs and their interests at different age levels.

The objectives of educational psychology may be summarized as to:

- provide teachers with some basic skills related to teaching,
- give teachers guidelines to solve problems of teaching-learning process,
- help teachers to understand the scientific knowledge, and
- instil in teachers a spirit of inquiry for their professional growth.

1.4 SCHOOLS OF PSYCHOLOGY AND THEIR CONTRIBUTIONS TO EDUCATION

It is a well-known fact that psychology has been influenced by a number of disciplines. Psychology as an independent field of study has emerged recently. It is very important for the prospective teacher to have an adequate knowledge of the systematic development of psychology so as to understand the behaviour of learners for bringing about desirable changes in them. There are different viewpoints or approaches or systems or schools of psychology.

1.4.1 Experimental Psychology and Experimentalist Psychologists

Four German scientists—Ernst Weber (1795–1878), Gustav Fechner (1801–1887), Hermann von Helmholtz (1821–1894) and Wilhelm Wundt (1832–1920), were intimately associated with the making of psychology as an experimental science. It was through research in physiology that each became interested in psychological problems. Wundt brought together the various lines of research in his first systematic book of psychology entitled *Physiological Psychology* (1873). He also founded the first experimental laboratory of psychology in Leipzig (Germany) in 1879. Earlier William James (1842–1910), an American philosopher and scientist, had set up a small demonstration laboratory at Harvard in 1871, which he used as an adjunct to teaching.

After receiving his M.D. degree in 1858, Wilhelm Wundt started his career as a physiologist, but soon became interested in the more complex mental processes and was convinced that experimental methods of the physiologist could be applied to research on consciousness. Wundt is called the 'father of experimental psychology'.

Check Your Progress

1. Differentiate between 'overt behaviour' and 'covert behaviour'.
2. What is 'environmental psychology'?
3. Cite a usage of 'educational psychology' to a teacher.
4. What is meant by a 'learning situation'?

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Wundt's psychology was transplanted to the United States by his most outstanding student, Edward Bradford Titchener (1867–1927). His another brilliant student James McKeen Cattell (1860–1944) of Columbia University worked on the psychology of individual differences.

E.B. Titchener (1867–1927) carried systematic research on the lines of Wundtian tradition. He believed that the science of psychology should deal only with things as they *are* found to exist. The main objective of psychology is to study and understand human mind and its structure that is isolating elementary processes from the complexity of consciousness. In his own words: 'No concrete mental process, no idea of feeling that we actually experience as part of a consciousness is a simple process, but that all alike are made up of a number of really simple processes blended together. These simple processes are called "mental elements". They are numerous; there are probably some 50,000 of them; but they all be grouped into broad classes, as sensations and affections.' Scientific enquiry goes from "parts to the wholes". So, one must begin with the atoms of a total situation.

Structuralism has been criticized on the ground that general system of psychology was too narrow to embrace all aspects of human behaviour.

Educational implications: Since structuralism emerged out of laboratory experiments in Germany, it gave a careful method of data collection. It laid stress on the spirit of science and experimentation in treating education-al matters. It emphasized systematic observation of the activities of mind. Experiments in the field of educational psychology were initiated on the basis of experimentation of structuralism.

1.4.2 Functionalism and Functionalist Psychologists

Functionalism is the name given to a system of psychology which studies mind as it functions in adapting the organism to its environment. The roots of this viewpoint go back to the evolutionary biology of Charles Darwin (1809–1882) and the pragmatic philosophy of William James (1842–1910). The functionalist viewpoint came into educational psychology and developed into a movement under the leadership of John Dewey (1859–1952), James Rowland Angell (1869–1949) and Harvey Carr (1873–1954).

William James spent most of his academic career at Harvard University. He was in turn a physiologist, psychologist and philosopher. His outstanding contribution in psychology was his brilliant book, *Principles of Psychology* (1890). His another book, *Talks to Teachers* (1899) is also of great significance. James made it clear that mind, as it is revealed in habits, knowledge and perception is constantly engaged in active give-and-take relations with the environment. Mind, therefore, is useful or functional in adjustment. He emphasized the role of interest in learning. He stated, 'the great thing in all education is to make the nervous system our ally instead of our enemy'.

John Dewey (1859–1952) was a great philosopher, educator and psychologist. Dewey developed an interest in psychology, while working for his doctorate on Immanuel Kant (1724–1804). It was at Michigan University where he taught psychology as well as philosophy, and Dewey wrote his functionally oriented textbook entitled, *Psychology* (1896) which became highly popular with undergraduate students. In keeping with his functional viewpoint in psychology, Dewey's philosophy saw social change as inevitable and capable of being directed for man's benefit. He treated ideas as plans for action that help the individual solve problem, of living and adjustment. In

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1896, Dewey published his famous paper, "The Reflex Act Concept in Psychology" in which he argued that reflexes and other forms of behaviour ought to be interpreted in terms of their significance for adaptation. He believed that the study of the "organism as a whole functioning in its environment" was the proper subject-matter for psychology. In due course, Dewey became world famous as an exponent of the pragmatic viewpoint in philosophy and for his advocacy of progressive education.

Contribution of functionalism to education

Following is the chief contribution of functionalism to education:

1. Functionalism stresses that behaviour is adaptable to new situation of life. Accordingly, the teachers and the principal should provide such an environment to the students for learning as is conducive to arouse and sustain their motivation in learning.
2. Functionalism tended to replace theoretically overloaded curriculum by practical approaches.
3. Learning by doing was given a central place in the methods of teaching-learning.
4. Functionalism emphasized the study of the various problems of the individual and their solutions.
5. It contributed a lot to child psychology and mental testing.
6. It pointed out the importance to understand the needs of children at different age levels.
7. It stressed the aspect of utility. In other words, it indicated that only those subjects should be included in the curriculums which were useful in society.
8. It led to the development of scientific enquiry in education.
9. It initiated new methods of teaching and learning.

1.4.3 Behaviourism and Behaviouristic Psychologists

John B. Watson (1878–1958) was an American psychologist who became an ardent proponent of behaviourism. As a graduate student at the University of Chicago, during formative years of functionalistic movement, he became interested in animal research and founded an animal laboratory. He emphasized the study of behaviour by experiments. Watson explained his behaviourism in an article "Psychology and the Behaviourist" which was published in the *Psychological Review* (1913). He explained his point of view in three books—*An Introduction to Comparative Psychology* (1914); *Psychology from the Standpoint of a Behaviourist* (1919) and *Behaviourism* (1925). He believed that concepts like mind-consciousness and *image* have no place. He stated that, psychology was the *Science of Behaviour*. According to him, behavioural acts are to be described objectively in "terms of stimulus and response, in terms of habit formation, habit integration and the like". Watson discarded mentalistic concepts such as consciousness and mind, etc., and proposed the following methods for the behavioural research:

1. Observation, with and without instrumental control.

2. The conditioning reflex method.
3. The verbal report method.
4. Testing method.

Watson showed how the objective, analytic methods of animal laboratory could be applied to human beings, particularly through the use of the conditioning response. In his book, *The Psychological Care of the Infant and Child* (1929), he pointed out the use of infants and children as subjects for psychological investigation. Watson suggested that the behaviouristic psychology had much to offer such professions as advertising, law, industry and education.

Contribution of behaviourism to education

P. Symonds has given the following implications of behaviourism for teaching and learning: 'The most potent reward (reinforcement) for class-room learning is the teacher's acceptance what the pupil does and the way he does it because this acceptance becomes a guide in his future activities. This acceptance on the part of the teacher can take the form of tangible tokens, such as gold stars, honours rolls and the like. But there is a tendency to short-circuit so that a "correct or right" will do equally well.'

Following are the chief contributions of behaviourism to education:

1. Behaviourism has given new methods and techniques of understanding the child behaviour.
2. It has contributed to the understanding of the emotions of the child.
3. It has given new methodology of teaching known as "programmed learning" which has been successfully employed in several countries.
4. It points out that all behaviour is learnt in the process of interaction with environment.
5. It emphasizes the importance of environment and its impact on human growth.
6. It has led to the development of new approaches, methods and techniques of dealing with maladjustment in children.
7. It has brought psychology out from the controversy of mentalistic approach to human behaviour.
8. It has greatly contributed to the psychology of learning.
9. It has indicated the importance of motivation.

1.4.4 Gestalt School and Gestalt Psychologists

Gestalt psychologists took up arms against behaviourist and functionalist psychologists. They were represented by Max Wertheimer (1880–1943), Wolfgang Kohler (1887–1967) and Kurt Koffka (1886–1941)—all German psychologists. The fundamental Gestalt principle is that "the whole is different from the sum of its parts". Gestalt is a German word meaning *whole, form, figure or configuration*. The Gestalt psychologists took a *dynamic or field* view of the nervous system in place of the behaviouristic machine view.

Although born in Prague (Czechoslovakia), Wertheimer is associated with German psychologists as he did a lot of research work at the German Universities. He launched the Gestalt School as a new movement opposed to both structuralism

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and behaviourism. In his well-known book, *Productive Thinking* (1945), he attacked the traditional view of "association" and "rote learning" as the foundation of the thought processes. Wertheimer demonstrated with considerable success that when the teacher arranged problems to organize the elements of classroom exercises into meaningful wholes, insight would occur. This he contrasted sharply with the usual educational practices of *drill* and *rote-learning*. There were extensions of the Gestalt viewpoint into personality, child psychology and motivation, etc.

Contribution of Gestalt psychology to education

1. Gestaltists give importance to the perception of relation, organization and whole in learning. They state that it is the whole which determines the behaviour of its part. This implies that the teacher should present his subject-matter as a whole in the class.
2. Goals and purposes have an important place in learning. They activate the learners.
3. The teacher should start where the learners' perception are and not where his own perceptions happen to be.
4. The principal, the teachers and the students should work as an *organized whole* to improve the teacher-learning process in the school.
5. Behaviourism has thrown new light on the group or social learning in the classroom. It considers group behaviour to be an important factor in learning.
6. Gestalt psychology points out the need for interdisciplinary approach to educational problems.
7. Gestalt psychologists stress that learning by *insight* is more forceful.
8. Gestalt psychology emphasizes the importance of desirable environment for learning.

1.4.5 Psychoanalysis School and Psychoanalysts

In the words of J.P. Chaplin and T.S. Krawiec (1979), 'Of all the schools of psychology, psychoanalysis has captured the imagination of the general public to the extent that many laymen erroneously equate psychology with psychoanalysis.'

This highly influential movement got underway in Vienna at the end of the 19th century under the leadership of Sigmund Freud (1856-1939). Freud obtained a degree in medicine with specialization in neurology. As a practising physician, he became aware that many of his patients were in reality suffering from mental conflicts that were manifested as physical ailments and disorders. He was convinced that what the patient needed was psychotherapy rather than physical therapy. He became associated with a French practitioner J.M. Charcot (1825-1893) and a German J. Breuer (1842-1925), who had been utilizing hypnotic treatment in the case of hysteric patients.

Freud deeply studied the technique of hypnotherapy and found that its scope was limited and in several cases the cure was superficial. The illness subsequently broke out in another form with a different set of symptoms. Freud eventually recognized that the real value lay in the psychic analysis.

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The psychoanalysis usually consists of having the patient relax on a couch and freely tell whatever comes to his or her mind. This is the method of *free association*. The psychoanalyst listens to and observes the patient as unobstructively as possible for emotional reactions, signs of distress and resistance to treatment. Out of his clinical experience Freud developed a number of important concepts—the division of the personality into *id*, *ego* and *superego*. He emphasized the importance of unconscious in mental life. He considered the *dream* a main route into "unconscious process."

Dream interpretation became an important part of both the therapeutic process and theory of psychoanalysis. Freud also felt that sexual malfunctions underlie hysteria and other neurotic disorders. His conclusions that neurotic disturbances originate in early childhood have made everyone who is engaged in the care, training and education of children, extremely child-centred. The impact of Freudian psychoanalysis had a profound influence on the direction of development psychology which considers the child no longer as a miniature adult but as an individual with his or her own needs, potentials and problems.

Freud's collected works consist of 24 volumes. His landmark publications include the following:

1. *The Interpretation of Dreams* (1900)
2. *The Psychopathology of Everyday Life* (1904)
3. *The Three Essays on the Theory of Sexuality* (1905)
4. *Beyond the Pleasure Principle* (1920)
5. *The Future of an Illusion* (1928)
6. *Civilization and Its Discontents* (1930)

Contribution of psychoanalysis to education

1. Psychoanalysis has brought out the need for early childhood education.
2. Freud emphasized that unconscious motivation plays an important role in the process of learning.
3. Psychoanalysis emphasizes the importance of the experiences of early childhood in the process of learning and education. These early experiences play an important role in laying down the foundation of the personality of the child. Among the major factors leading to the development of positive attitudes in the child towards life are affection, love and sympathy.
4. Psychoanalysis states that children should get opportunities to express their emotions freely in and outside the class. This is very conducive to the healthy development of children.
5. Psychoanalysis throws a lot of light on the causes leading to maladjustment in children.
6. Psychoanalysis appeals to the teachers to be positive in their outlook.

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Table 1.1 Major Schools/Systems of Psychology At a Glance

Major School	Founder/Chief Exponent	Chief Method	Subject-matter of Study	Chief Areas of Concern
1. Associationism	1. D.Hartley (1705-1757) 2. E.L. Thorndike (1874-1949)	Philosophical Analysis	Cognitive Process	Laws of Memory, Nature of Learning
2. Psychophysics and Quantitative Psychology	1. E.Weber(1795-1878) 2. G. Fechner (1801-1877) 3. F. Gallon (1822-1911) 4. A. Binet (1857-1911)	Quantitative Measurement.		
3. Structuralism	1. W.Wundt (1832-1920) 2. E.B. Titchener (1867-1927)	Introspection.	Consciousness.	Sensation, Attention, Images, Affective Process.
4. Functionalism	1. William James (1842-1910) 2. John Dewey (1859-1952) 3. J.R. Angell (1869-1949)	Objective, Experimental Studies, Introspection.	Mind viewed in terms of its adaptive significance for the organism.	Perception, Learning, Mental Testing.
	4. Harvey Carr (1873-1954) 5. R.S. Woodworth (1869-1962) (Dynamic Psychology) 6. J. Piaget (1896-1980) (Cognitive thinking)			
5. Behaviourism	J.B.Watson (1878-1958)	Conditioning	Behaviour	1. Sensation. 2. Animal Learning. 3. Physiological Processes.
6. Gestalt	1. M. Wertheimer (1880-1943) 2. W.Kohler (1887-1967) 3. K. Koffka (1886-1941)	Phenomenological experimentation.	Mental and Behavioural Processes as wholes.	Perception, Thinking.
7. Psychoanalysis	Sigmund Freud (1856-1939)	Free Association and Dream Analysis.	Analysis of unconscious Dynamic Processes.	Psychotherapeutic Treatment of the Neurotic.
8. Humanistic and Existential Psychology	1. A.H. Maslow (1916-1970) 2. C.R. Rogers (1902-NA)	Phenomenological Analysis.	Modes and Problem of Existence.	Personality Work Ethos.

1.4.6 Constructivism

Constructivism is a basic theory that elaborates on how knowledge is built (or, "constructed") when new information pours in and comes in contact with the already existing knowledge bank, which has been developed in the course of time by various researchers. Constructivism finds its roots in cognitive psychology as well as human biology. It is that approach to education which gives due emphasis to the various methods followed in the creation of knowledge, and that finds adaptability in the changing education scenario.

Constructs are the special types of filters that are selected in order to place over those realities to bring change in the existing reality—from the state of 'chaos' to the state of 'order'. Von Glasersfeld describes constructivism as 'a theory of knowledge with roots in philosophy, psychology, and cybernetics'. Constructivism finds its implications in the theory of instruction. Discovery, hands-on, experiential, project-based and task-based learning process, and collaborative are a number of applications that base teaching and learning on constructivism.

It is not at all necessary that constructivist learning theory implies that a learner must follow a "constructivist" pedagogical strategy. Rather, it is the opinion of most

of the researchers that knowledge is constructed, but a few, for instance, mainstream instructional designers) do not adopt an instructional design pattern, which can be tagged as being "constructivist".

In a normal situation, a constructivist teaching strategy is based on the assumption that learners learn best when they gain knowledge through exploration and active learning. In place of textbooks, hands-on materials are utilized, and the learners are motivated to think and reason. Moreover, they need to give explanation on their reasoning, rather than memorizing and reciting facts fed to their memory. Education revolves around the themes and concepts, and the relationship between them; rather than isolated information.

Under the theory of constructivism, educators focus on building relations between facts and promoting new understanding in students. Instructors tailor their teaching strategies to student responses and encourage their students to analyse, interpret and predict information. Teachers/Instructors also rely heavily on open-ended questions and promote extensive dialogue among learners. Constructivism calls for the elimination of grades and standardized testing. Rather, the theory of constructivism suggests that assessment becomes a part of the learning process with the intention that learners can play a bigger role in evaluating their own growth.

ACTIVITY

Research on the Internet and give a detailed account on the formation of Gestalt school of psychology.

DID YOU KNOW

In the 20th century, constructivism had a great impact on various modern art movements including graphic and industrial design, architecture, theatre, film, fashion, dance, and even music.

1.5 SUMMARY

In this unit, you have learnt that:

- Behaviour includes the actual actions and responses of organisms, both animals and human beings.
- Psychology tries to develop cause-and-effect relationship between different variables under study, and then formulate theories based on the findings.
- Physiological psychology is that science which studies the biological bases of behaviour. Physiological psychologists want to explore the relationship between body processes and behaviour.
- Aerospace psychologists try to design training programmes for the astronauts so that they can adapt their behaviour according to the new environmental settings and are in sound mental health.

Check Your Progress

5. Give a drawback of 'structuralism'.
6. Cite a benefit of 'behaviourism'.
7. What is the basic contribution of Gestalt psychologists to education?
8. What is the basic role of an educator as per the theory of constructivism?

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- Psychology has a very important role to play in the field of education. Psychologists work in schools and universities to guide students in their educational and vocational problems. They also work to solve problems of adjustment. Conducting aptitude, intelligence and personality tests is a part of their counselling sessions.
- Educational psychology is the application of psychological findings in the field of education. It is the systematic study of the development of the individual within the educational settings.
- Psychological principles are also used in formulating curriculum for different stages. Needs of the students, their developmental characteristics, learning pattern and needs of the society, all these are to be incorporated in the curriculum.
- It is very important for the prospective teacher to have an adequate knowledge of the systematic development of psychology so as to understand the behaviour of learners for bringing about desirable changes in them.
- As per the experimental psychology, the main objective of psychology is to study and understand human mind and its structure that is isolating elementary processes from the complexity of consciousness.
- Functionalism stresses that behaviour is adaptable to new situation of life. Accordingly, the teachers and the principal should provide such an environment to the students for learning as is conducive to arouse and sustain their motivation in learning.
- Gestaltists give importance to the perception of relation, organization and *whole* in learning. They state that it is the *whole* which determines the behaviour of its part. This implies that the teacher should present his subject-matter as a whole in the class.
- The psychoanalyst listens to and observes the patient as unobstructively as possible for emotional reactions, signs of distress and resistance to treatment. Out of his clinical experience Freud developed a number of important concepts—the division of the personality into *id*, *ego* and *superego*. He emphasized the importance of unconscious in mental life. He considered the *dream* a main route into “unconscious process.”
- Constructivism is a basic theory that elaborates on how knowledge is built (or, “constructed”) when new information pours in and comes in contact with the already existing knowledge bank, which has been developed in the course of time by various researchers.

1.6 KEY TERMS

- **Abnormal psychology:** Study of various forms of abnormal behaviour, and its treatment through various psychological techniques
- **Behaviour:** The way one acts in a given situation
- **Educational psychology:** Application of psychological findings in the field of education
- **Folk psychology:** Branch of psychology which aims to study the culture, art, religion, superstitions and other such aspects

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- **Learning process:** Signifies whatever people do when they learn
- **Learning situation:** Refers to the environment in which the learner finds himself/herself, and in which the learning process takes place
- **Rote memorization:** Memorization technique that is based upon repetition of study material
- **Total behaviour:** Includes both covert and overt activities

1.7 ANSWERS TO ‘CHECK YOUR PROGRESS’

1. ‘Overt behaviour’ is that behaviour which can be observed and measured, and ‘covert behaviour’ is that behaviour which includes our inner experiences and those mental activities that are going on in the brain.
2. ‘Environmental psychology’ is that branch of psychology which refers to role of environment on behaviour. Here, the psychologists lay emphasis on modifying and restructuring environment for social well-being.
3. Educational psychology helps the teacher to transform a student into a responsible and participating citizen; a sensitive and reflective human being; and a productive and creative person.
4. The ‘learning situation’ refers to the environment in which the learner finds himself/herself, and in which the learning process takes place. It includes factors or conditions that affect the learner and the learning process. The teacher is one element and another is the classroom setting (ventilation, light, noise and arrangement of seats, etc.).
5. Structuralism has been criticized on the ground that general system of psychology was too narrow to embrace all aspects of human behaviour.
6. Behaviourism has given new methods and techniques of understanding the child behaviour.
7. Gestaltists give importance to the perception of relation, organization and *whole* in learning. They state that it is the *whole* which determines the behaviour of its part. This implies that the teacher should present his subject-matter as a whole in the class.
8. Under the theory of constructivism, educators focus on building relations between facts and promoting new understanding in students.

1.8 QUESTIONS AND EXERCISES

Short-Answer Questions

1. What are the principles of learning?
2. What are the basic assumptions of Kurt Lewin’s Field Theory of Learning?
3. What are the educational implications of Hull’s Reinforcement Theory?
4. What are the basic postulates of Achievement Motivation Theory?
5. Write a short note on ‘Constructivism’.

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Long-Answer Questions

1. Give a detailed account on various theories of learning.
2. Explain Maslow's Self-Actualization Theory.
3. Write a short note on Gagne's Hierarchy of Learning.
4. Give a detailed account on any two theories of 'transfer of learning'.

1.9 FURTHER READING

Gelder, M., R. Mayou and P. Cowen; *Shorter Oxford Textbook of Psychiatry*, Fourth edition. Oxford University Press, Oxford, 2004
 Sadock, B.J. and V.A. Sadock; *Concise Textbook of Clinical Psychiatry*, Second edition, Lippincot Williams Wilkins, Philadelphia, 2004
 S.S. Chauhan; *Advanced Educational Psychology*, seventh edition, Vikas Publishing Pvt. Ltd., New Delhi, 27

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UNIT 2 METHODS OF EDUCATIONAL PSYCHOLOGY

Structure

- 2.0 Introduction
- 2.1 Unit Objectives
- 2.2 Experiment Method
- 2.3 Differential Method
- 2.4 Clinical Method
- 2.5 Observation Method
- 2.6 Introspection Method
- 2.7 Summary
- 2.8 Key Terms
- 2.9 Answers to 'Check Your Progress'
- 2.10 Questions and Exercises
- 2.11 Further Reading

2.0 INTRODUCTION

Educational psychology is the scientific study of the behaviour of the learners in relation to their educational environment. Behaviour in all its aspects can be studied scientifically through a single technique or approach known as observation. This leads us to the simple conclusion that observation may be regarded as the only method or technique for conducting studies of behaviour. This single technique or approach, however, gives rise to several methods or approaches, depending upon the conditions in which observations have to be recorded, the procedure adopted and tools used. In this unit, we will describe the important methods that are generally used to collect data to find out the solutions of various problems, which the teacher faces in teaching-learning process in classroom.

In this unit, we would be discussing the major methods of educational psychology—experimental method, differential method, clinical method and observation method. Two more significant methods of educational psychology—(i) introspection method, and (ii) scientific enquire method—have also been discussed in detail in this unit.

2.1 UNIT OBJECTIVES

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

- Discuss the basic features of experiment method of educational psychology
- Explain the basic concepts of differential method of educational psychology
- Elaborate on the merits and demerits of clinical method and observation method of educational psychology
- Discuss on the introspection method and scientific enquiry method of educational psychology

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2.2 EXPERIMENT METHOD

The experimental method is considered to be the most important method of scientific enquiry, which has been developed in psychology by the continuous efforts of psychologists for an objective and scientific study of human behaviour. One of the major contributions of behaviourism is the development of the experimental method in order to understand, control and predict behaviour. The experimental method is considered to be a method par excellence for use in certain areas of educational psychology. It is the most precise, planned, systematic and controlled form of observation.

According to some psychologists, only experiments make controlled observation, variation of factors, perfect quantification and rigorous objective checking of hypothesis possible. The experimental method uses a systematic procedure called experimental design. The term 'experiential design' has two different meanings. One is that experimental design represents the six basic steps referred above which are generally followed in an experiment. The second meaning of experimental design is more restrictive. It defines experimental design as a procedure for assigning subjects to experimental conditions and selecting an appropriate statistical procedure. Experimental design provides important guidelines to the researcher to carry out his/her research systematically. The stability of the design depends on the findings of the research study. The layout of a design depends on the type of problem the investigator wants to investigate. Readers should know that no one design solves all the problems of a research study.

There are many problems in education psychology due to which research in a laboratory set-up cannot be conducted. Such problems are studied in actual classroom situations. A variety of experimental designs have been developed by researchers in recent years. To acquaint the readers with the basic structure of experimental design, we will give an example of laboratory experiment and then a few experimental designs to be used in actual classroom situations.

Laboratory experiment

Some problems can be conveniently studied in a laboratory where the experimenter can control all variables except the one under study. The experiments can be conducted on individuals or a group of subjects. Thorndike's experiments on cast, Ebbinghaus's experiments on memory, mirror drawing, attention, perception, and learning are all examples to laboratory experiments. A sample of laboratory experiment is described as follows:

1. *Name:* Maneesh *Age:* 10 years. *Sex:* Male
2. *Date:* 6.2.83 *Time:* 10 A.M.
3. *Physical and mental condition:* Normal
4. *Problem:* To study the problem of bilateral training.
5. *Apparatus and material:* Micro drawing experiment apparatus, stop-watch, paper, and pencil.

Instruction: Detailed instructions are given to the subject to perform the task.

6. Experimental design and data

S. No.	Trial	Time	Error
1.	Right hand		
2.	-do-		
3.	-do-		
4.	-do-		
5.	-do-		
6.	-do-		

7. *Analysing the results:* The investigator analyses the data obtained from the subject.

8. *Conclusion:* The investigator on the basis of his analysis of data draws a certain conclusion.

Experimental designs outside the laboratory

Experimental designs can be divided on the basis of two important factors, i.e., the control procedure and the number of groups involved in an experiment. The type of control employed in experiment plays an important role in determining the reliability and validity of the conclusions drawn from the experiment. The number of groups involved in an experiment is important to determine the control procedure and the type of research problems an investigation may answer.

The number of groups may vary from one to three up to an infinite number of groups depending on the type of problem and nature of control procedure employed by the experimenter. Following are the samples of experimental design:

1. One group design

- a. *One group pre-test design:* This type of design is the simplest one. It is commonly called pre-experimental design. In such a type of experiment no formal comparison is possible, for there is no second group with which any comparison can be made. Let us illustrate with an example: Suppose a teacher treats 10 students who are addicted to smoking in a period of three months. At the end of the period, six students give up smoking. Such type of designs does not control any of the sources of invalidity.
- b. *One group post-test design:* This design has not been a successful one, though is considered better than the one group pre-test design. In this design, the experimenter first tests a group on some aspects of behaviour and then gives special treatment (X) to the same group. He/She tests the performance of the group after the special treatment. He/She statistically analyses the data and calculates the difference between the pre-test and post-test scores of the group.

Pre-test Independent variable post-test

T1

X

T2

Example: Suppose in the beginning of the semester, we administer a test of educational psychology to students of M.Ed. education and then teach them the subject throughout the semester. At the end of the semester, we administer the post-test (T2) and determine the difference between the scores on the initial and final tests.

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2. Two group design

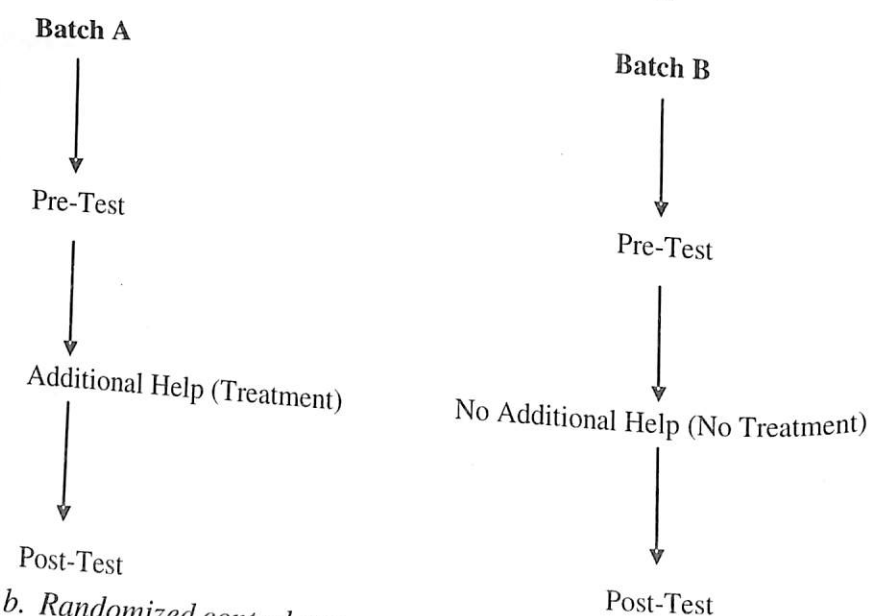
Research in education and psychology has often been criticized for lack of control. In recent years, more rigorous designs have been evolved by using statistic to make researches more scientific and objective.

Generally, researchers use two parallel group techniques to see the effects of an independent variable on some dependent variable. Two groups are equated on the basis of significant variable. One group is known as the experimental group and the other is called the control group. The experimental group is subjected to a certain experience or to a specific treatment, whereas the control group is not given any type of special treatment. After providing special treatment to the experimental group, both the groups are administered the same final test. The scores are statistically compared and conclusions are drawn as regards to the effect of special treatment on the experimental group.

a. *Pre-test post-test design*: In this design both, experimental and control groups are administered pre-test and then the experimental group is given special treatment (X), whereas control group is not given any type of treatment. After the special treatment, post-test is administered to both the groups. The paradigm is as follows:

S. No.	Group	Pretest	Treatment	Post-tests
1.	Experimental	T_1E	X	T_2E
2.	Control	T_1C	No training	T_2C

Example: Suppose in a tuition centre, we teach two batches (A and B) the same subject. However, one batch (A) is presented with additional help in form of online tips, while the other batch (B) receives no extra aid. Both the batches are then tested. We test both the groups—pre-test and post-test. Thus, this may be diagrammatically represented as follows:



b. *Randomized control-group pre-test post-test design*: The researcher in this design follows the following procedure:

- He/She selects the subject by random method.
- Assigns subjects to group and X (Treatment) to groups by random method.
- Tests the Ss on the dependent variable.

(iv) Keeps all conditions the same for both the groups except for exposing the experimental S but not the control group to the independent variable for specific time.

(v) Test the 'Ss' on the dependent variable.

(vi) Finds the difference between the two.

(vii) Compares the results to see whether the application of 'X' (treatment) caused a change in the experimental group.

(viii) Applies an appropriate statistical procedure.

3. Matched two group design

A matched two group design is a modification of the totally randomized two group design described above. In this design, both groups are matched in terms of some variable, the experimenter feels he/she would influence the dependent variable. Suppose, we want to test the retention of two types of words closely associated and disassociated. We believe that IQ will influence how well a person can retain words so we match the two groups on IQ. Let us be more concrete to understand this point. Suppose there are ten subjects with IQ as follows:

Subjects	I.Q.
1.	110
2.	110
3.	90
4.	90
5.	80
6.	80
7.	80
8.	80
9.	70
10.	70

In order to divide the ten subjects into two matched groups of 5 subjects each. We first divide the ten subjects into five pairs by going down the list making 1 and 2, 3, 4, and so on. We then randomly assign one of each pair to either group A or B by flipping a coin.

4. Multi group design with one independent variable (ANOVA)

Sometimes the investigator has to compare the effect of different values of some variable, or has to see the effect of several alternative variables on more than two groups. The procedure for carrying out one-way analysis of variance (ANOVA) is the same as for two group designs. The distinguishing feature between the two types of investigation is the type of statistical analysis used.

5. Factorial design

Factorial design is employed where more than one independent variable is involved in the investigation. Factorial designs may involve several factors, which are symbolically represented in the following way:

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Design	Symbolic
Two factors	A X B
Three factors	A X B X C
Four factors	A X B X C X D
N factors	A X B X C X D X N

6. Small N design

We have briefly mentioned various experimental designs, which are termed as 'large N group design'. In all large N group designs, the number of subject is large and is divided into two groups. The large N group design is not always applicable in a classroom situation. In many instances, the psychologist or teacher is faced with situations in which a large N is not possible, for example, delinquency, problem of indiscipline, etc. With the introduction of statistics in psychology, it is possible to conduct scientific research on a small N group.

Merits of experimental method

The merits of experimental method are as follows:

- Experimental method is the most systematic procedure of solving problems. It provides reliable information. The major advantage of this method is the ability of the experimenter to control the application and withdrawal of independent variables.
- The finding of experimental method are verifiable by other investigators under identical conditions in which the initial experiment was conducted.
- It provides objective and precise information about the problems.
- Use of computers in data analysis in recent years has opened new frontiers of possibilities for the study of complex problems.
- It advances our stock of knowledge of cause-effect relationship in the behaviour of students and provides guidelines to solve teaching-learning problems.
- It tests the traditional beliefs and throws new light on the problems and opens avenues for future progress.
- It provides innovative ideas for further experimentation.
- The experimenter can apply a controlled procedure more precisely in a laboratory experimentation. The experimenter can record the dependent variables more precisely.

Demerits of experimental method

The demerits of experimental method are as follows:

- The main objection raised against the experimental method is that an experiment is an observation of an artificially determined pattern of behaviour as Thorndike's cat experiments or Skinner's rat experiments. Thus, we can say that the experimental method sets its own limit by setting the experimental situation to study behaviour.

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- Experimental data does not provide insight into the total behaviour of the subject. We know that behaviour is, for all practical purpose, an interaction between the organism and its environment. Obviously, there is more than one way for such interaction to take place.
- G.S. Klein criticizing the experimental method remarked that the appearance of significant relations was often prevented by the rigorous experimental procedure of keeping variables constant. Instead of grasping the process as a whole, the experimentalists often omit important factors by their tendency to eliminate and isolate experimental variables or to keep them constant.
- Another limitation of the experimental method in educational psychology stems from the fact that experiments cannot handle patterns of covert behaviour of children in laboratory very well. Overt and violent actions (riots) do not fit into a laboratory setting. Moreover, the experimental method cannot accurately test the entire gamut of human drives and feeling.
- Psychologists have criticized the fact that most experiments have been conducted on rats, cats and dogs. Principles have been deduced on the basis of experiments on animals; how far it is justifiable to generalize those principles, and laws for human beings has not yet been conclusively decided.
- The experimental method is time consuming and costly. Every teacher cannot be expected to conduct an experiment as it requires specialized knowledge and skills to conduct experiments.
- All problems of educational psychology cannot be studied by the use of the experimental method. Due to complexity and tremendous variability of human mind and human phenomena, experiments in social sciences are not possible in the same sense as they are in physical science where we can repeat experiments a number of times under controlled and practically identical conditions.
- In recent years, psychologists and religious leaders have raised ethical questions in connection with administration of some psychological tests, which encroach upon the privacy of the subjects. Certain situations, may not be created because they are not socially acceptable as it is not possible to purchase human infants and raise them in extreme deprivation.
- The Gestalt psychologists criticize the experimental method because of its quantification aspect. They criticize the inappropriate, imprecise and faulty apparatus of psychologists. It is not possible to construct tools that will make accurate and sufficiently discriminating measurement of individual differences.
- In many cases, investigators cannot manipulate human beings and cannot adjust class schedules to meet the requirements of the research designs that are most theoretically desirable.
- Social scientists cannot generalize and apply their findings to all human beings. Experiments only produce statements of probability. Certainty cannot be achieved through experimentation.

2.3 DIFFERENTIAL METHOD

Differential method, also known as Survey method, is used to study individual differences among students. Studies in the field of educational psychology make extensive use of the statistical survey, which is based on sampling by direct observation.

Check Your Progress

1. What are the two basic factors on the basis of which we can divide experimental designs?
2. What is the basic difference between 'experimental group' and 'control group'?
3. On what grounds did the Gestalt psychologists criticize the experimental method?

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This method makes use of various techniques of collecting data such as tests, questionnaire, observation, interview and use of statistics in analysing the data.

There are three broad categories of survey method that share the common feature of carrying out their observation on samples of individuals, which are regarded as representative of the larger population to which they belong. The three categories are as follows:

- (i) **Field study:** A field experiment may be defined as a scientific investigation carried out in the field, which involves the direct manipulation of some independent variables. The field study is conducted in natural classroom teaching-learning situation spread over a wide area. Developing programmed material can be cited here as an example. The programmed material at its initial stage is tested on individual and small group of students for whom it is developed. After two initial tests, it is tried out in an actual classroom situation for a final validation, which is generally called a field try-out. Generally, in a field experiment steps are the same as those used in laboratory experiments.
- (ii) **Developmental survey:** Developmental survey and developmental clinical case-study though appear to be alike, differ in their purpose. Clinical method (case study) involves the individual, whereas developmental survey studies involve typical patterns of change in the growth and decline of behaviour over a specific period of lifespan of a group or an entire population. Developmental surveys may be longitudinal or cross-sectional. We can study the development of intelligence in culturally disadvantaged children from birth to five years using either longitudinal or cross-sectional method of study.
- (iii) **Differential survey:** O'Neil refers two examples of differential surveys, which he describes as 'those concerned with establishing typical differences between individuals and between classes of individuals'. The study conducted by Klineberg involving differences in intelligence between racial and national groups in Europe come under differential survey.

Merits of differential method

- Relatively easy to administer
- Can be developed in less time (compared to other data-collection methods)
- Cost-effective, but cost depends on survey mode
- Can be administered remotely via online, mobile devices, mail, email, kiosk, or telephone
- Conducted remotely can reduce or prevent geographical dependence
- Capable of collecting data from a large number of respondents
- Numerous questions can be asked about a subject, giving extensive flexibility in data analysis
- With survey software, advanced statistical techniques can be utilized to analyze survey data to determine validity, reliability, and statistical significance, including the ability to analyze multiple variables
- Broad range of data can be collected (e.g., attitudes, opinions, beliefs, values, behavior, factual)
- Standardized surveys are relatively free from several types of errors

Demerits of Differential Method

The possible sources of errors are as follows:

- **Sample error:** Sometimes, samples are not true representatives of the population. When the samples are biased, the results of the sample measured may not be true for the whole population.
- **Inadequacy of test content:** The sample of items and behaviour may also be inadequate. This is particularly true of mental test and personality tests. If the psychometric criteria of a reliable measuring instrument are not fulfilled, reliable results can scarcely be expected.
- **Non-cooperation of subjects:** The most significant source of error is lack of cooperation of the subjects. Sometimes, answers to the questions are not honestly given.

The differential method is based on individual differences. Therefore, all the measures applied to the calculation of individual differences are included in this method. The differential method is also named as the normative survey method or the field survey method as the investigator has to go to the field to make his/her investigations. It is sometimes called the statistical method for the reason that statistical techniques become the major devices for the study of individual differences. Now, the question that arises is, how do differential methods differ from experimental method? It may be felt that the difference between the experimental and differential methods is only arbitrary and artificial, since the procedure of finding the effects on dependent variables by the application of the independent variables is the same. This, however, is not true as T.G. Andrews (1958) comments:

'Differentiation between experiments and differential methods may appear quite artificial and it is true that all psychologists will not agree to such an apparently artificial classification scheme. Nevertheless, it should always be made clear that the independent variables resulting from individual difference are never under the investigator's control to the same degree that experimental variables are.'

Thus, differential methods differ from the experimental approach in that the investigator cannot intentionally manipulate the variables, and each of these is studied as an independent variable. For instance, in studying the relationship of achievement with intelligence, it is not possible to manipulate intelligence. Therefore, we have to take each individual and study his/her achievement in relation to his/her intelligence. After that, we can try to arrive at certain conclusions with the help of statistical techniques.

2.4 CLINICAL METHOD

The clinical method is primarily used to collect detailed information on the behaviour problems of maladjusted and deviant cases. The maladjustment may be in the form of anti-social behaviour, emotional disturbances, or backwardness in the area of learning and socio-economic environment. To collect complete data pertaining to a case, it utilizes various techniques to compile relevant information, which has some direct or indirect bearing on the specific problems of the case. The case is studied intensively in temporal sequence from birth of the individual to the present manifestation of the behavioural problems in other activities. The objective of the clinician is to delve deep into the unconscious of the individual to precisely locate the underlying cause of maladjustment and to suggest remedial measures. The complete and detailed study of a case may involve the use of observation, interview, medical examination; and use

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Check Your Progress

4. In educational psychology, why do we employ 'differential method'?
5. What is the basic difference between 'clinical method' and 'developmental survey'?

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of various tests of intelligence, personality, aptitude, interest, etc., the clinician collects the material about the case in totality. The past and present experiences, conditions in home, school and society are given due importance. Information from all sources is pooled together in a sequential order to prepare a comprehensive case history and locate the causes of maladjustment. Clinicians generally use two different procedures to develop case study, which are described in brief as follows:

1. Clinical case study/Case history

This method is specifically followed in learning difficulties, emotional disturbances, delinquency and other behaviour problems. This technique has been borrowed from medical science. The psychologist or the teacher, as the case, may collect detailed information of past history and present conditions. The developmental history is reconstructed from the memories of the case (individual), family and friends. The preparation of a case study is not the work of a single individual, but a combined venture of the social workers, teachers, parents, doctors and psychologists. In preparing a clinical case study, the information is collected from the following sources:

- (a) **Preliminary information:** Name, age, sex, parents' age, education, occupation, income, number of children, social status.
- (b) **Past history:** Condition of mother during pregnancy, any incident—child's development after birth—physical, mental, emotional, social-illness, relation between parents and other members of the family, achievement of the child, parents' death, birth order, etc.
- (c) **Present condition:** The information may be collected under the following heads:
Physical: Results of medical examination of any disease.
Mental: I.Q. special abilities, general intelligence.
Social: Home environment, friends and their types, social environment in school, home and neighbourhood.
Emotional: Anxiety, fear, temperament, attitude, etc.
Interest: Personal, social, vocational, and special aptitude.
School achievement: Position in school, failure, special achievement, etc.

We have given a tentative list of various sources from which information may be collected to prepare a case history. The sources of information can vary in individual cases depending upon the type of behaviour problems of the case. Briefly, we can summarize that case study method helps to understand the root causes of maladjustment and is a very valuable method in suggesting remedial measures for the rehabilitation of maladjusted cases.

Limitation of clinical case study

The limitations of clinical case study are as follows:

- In the preparation of a case study, the clinician collects descriptive account of the individual from his/her past life and present experiences. The accounts given by the individual, parents and friends may or may not be true since all the disadvantages of crude observation and anecdotal report are involved. The information is not verifiable and is highly subjective. In India, parents, particularly illiterate, hide the defects and problems of their sons and daughters and exaggerate their qualities. Information supplied by them may hardly be relied upon to reach some definite conclusions. The veracity of the subject, memory, embellishments of vivid details, and so on, can influence the case history.

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- Complex behaviour is observed under complex conditions, some of them in the past and in spite of clinical insight, the observer has no guarantee from the procedure that the events and the uniformities observed are relevant and crucial ones. Some striking aspect of the case may distract the observer's attention away from others that may be more critical, but less spectacular, and there is nothing inherent in the method to prevent this error.
- The third limitation involves the question of theoretical interpretation of the data. The clinician sets the stage for his/her investigation according to the theoretical position he/she espouses (Freudian as Rogerian), and often has to make his/her interpretation after the event of observing. Since the clinician's observation is likely to be influenced by his/her theoretical preference, so are the conclusions.
- The procedure is largely intuitive and impressionistic. Interpretations may depend on the aspects of the case that make the bigger impact on the observer as positive instances. There is nothing about the method to minimize the common sources of error.

2. Developmental case study

In developmental case study, or genetic method, two approaches are generally followed to collect the data:

- (a) **Longitudinal approach:** In this approach, we select a sample of children (from birth to maturity or of any specific age level) and observe their developmental characteristics continually from year to year. Ideally, it would necessitate observation for 24 hours a day, year in and year out; but in practice, it is not possible for the clinician to devote so much time to record observation. Developmental studies on animals have been conducted, but their results cannot be generalized for human beings. Continuous developmental studies are time-consuming, so psychologists have recorded substantial segments or sampling of behaviour throughout the principal developmental periods of the child. Tests are applied and assessment is made at regular intervals. This technique can be used to study physical, mental, language, interest, emotional, and social developmental characteristics of children.
- (b) **Cross-sectional approach:** The second approach is the cross-sectional in which we select a sample from different age levels to study specific aspects of development. For example, we can study reading interests, play activities or emotional and social characteristics of children of different ages. Both approaches have their advantages and disadvantages.

The above discussion regarding the nature and working of the clinical methods may lead us to conclude that clinical methods in all their shapes and forms are always concerned with the diagnoses and treatment of adjustment problems or mental and psychological illness of the individual. It is, however, not necessary that clinical methods should always be used to study or treat mental illness or abnormal behaviour of an individual.

The real purpose of clinical findings is to help in conducting an intensive and thorough study of the behaviour of the individual. Therefore, it does not matter whether we carry out the study of a normal or abnormal behaviour with the help of a clinical set-up. There is no bar to study the behaviour of normal persons or even exceptional individuals like high achievers, creative geniuses, saints, social workers and leaders by employing clinical methods of collecting relevant information through various

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means. Whether an individual requires treatment or follow-up depends upon the case under clinical study. A clinical study, thus, does not necessarily require the methods of treatment. The treatment can be affected only when the individual under study needs it. Therefore, broadly speaking, clinical methods may be considered as the methods of studying the behaviour of an individual in all possible details, relevant to the purpose of the study.

2.5 OBSERVATION METHOD

With the development of psychology as an objective science of behaviour, the method of introspection was replaced by careful observation of human and animal behaviour to collect data by research workers. Observation literally means looking outside oneself. It is one of the important and basic methods for collecting data in almost all types of research studies. This method produces one of the basic elements of science, i.e., facts that are collected by observing the overt behaviour of the organism in order to locate underlying problems and to study developmental trends of different types.

Overt behaviour is the manifestation of cover conditions within the organism. The study of overt behaviour, indirectly gives the clue to the mental condition of the organism. The development of systematic observation, as a method of collecting data, generated interest in developmental psychology and many studies on developmental characteristics of children were conducted that made great contributions to the field of child psychology. Observation may be of the following types: direct and indirect, natural and artificial, scheduled and unscheduled, participant and non-participant. Here, we will describe only two types of observations:

(i) **Natural observation:** In natural observation, we observe the specific behavioural characteristics of children or adults in natural settings. Subjects do not become conscious of the fact that their behaviour is being observed by someone. The teacher can observe the behaviour of his/her students on the playground or in any other social situation when students may not become conscious of his/her presence. In a child clinic, a one-way screen is used to observe the behaviour of deviant children. The observer can observe the behaviour of children, but cannot see the observer.

(ii) **Participant observation:** In this form of observation, the psychologist establishes perfect rapport with a group of adolescents so that they may not become conscious of his/her presence and may not hide their actual behaviour.

Observation studies are particularly very important and yield significant results on the developmental characteristics of children. No doubt, observation is a scientific technique of collecting data whose results can be verified and relied upon to locate behavioural problems of different types, but it suffers from limitations as well.

Merits of Observation Method

- Being a record of actual behaviour of the child, it is more reliable and objective.
- It is an excellent source of information about what actually happens in classroom.
- It is a study of an individual in a natural situation and is therefore more useful than the restricted study in a test situation.

Check Your Progress

6. Name the two procedures used by clinicians to develop a case study.
7. In which circumstances, one can use the longitudinal approach to developmental case study method of educational psychology?

- The method can be used with children of all ages. Younger the child, the easier it is to observe him. This method has been found very useful with shy children.
- It can be used in every situation, physical - activities, workshop and classroom situations as well.
- It is adaptable both to the individuals and the groups.

Demerits of Observation Method

The demerits of observation method are as follows:

- Observation is useful only for collecting data over behaviour, which is manifested in a number of activities. This overt behaviour does not provide reliable information regarding the internal mental process. We can only guess about the mental state of the individual on the basis of overt behaviour, which may or may not be true. It becomes very difficult to draw any conclusion in case of adults who can hide their actual behaviour in the presence of the observer. In such cases observation fails and yields on tangible results, which may throw light on the actual behaviour of the subjects.
- Subjectivity of interpretation is another limitation of observation. The observer may interpret his/her sensations of external stimulus on the basis of his/her past experiences. He/She may be biased in his/her interpretation by his/her likings, disliking, value, etc. The observation may be influenced by his/her perception of the situation when he/she makes inferences on the basis of scanty sensory cues. It also suffers from impressionism, prejudice and distraction, etc. It has also been found in some studies that strong personal interests tend to make the researcher see only those things, which he/she wants to see.
- Observation is subjected to two kinds of errors—(i) sampling error and (ii) observer's error. The first error occurs because of inadequacies of selecting the situation to be observed. The observer's error may be due to the knowledge and background of the situation to be observed. Sometimes, the observer is not familiar with the total situation and hence may commit error.

Suggestion for improvement

In recent years, improvements have been made in the methodology of observation to make it a more objective and reliable instrument of collecting data for research purpose. The following suggestions are given in order to eliminate the types of errors:

- **Use of mechanical devices:** Generally, observers do not record their observations immediately on the spot. However, the observations should be immediately recorded. They should not be left for future because there is every possibility of their being contaminated to the personal prejudices and left out due to failure of recall. The use of a mechanical device, such as a camera or a tape recorder, may be made to improve the reliability of observation. A system of notation, or shorthand, may be used for recording purposes.
- **Definite objectives:** The investigator must in advance specify in clear and definite the terms of the objectives of the observation. A detailed analysis of the behavioural characteristics that are to be observed should be ensured.
- **Schedule:** The investigators must decide the time and hour of observation and a schedule should be honestly followed. A detailed schedule in the form of questions or statements should be prepared in advance to note down the

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observations. The method of recording the observation should be made clear. It will be more reliable and objective if a numerical value is assigned to various aspects of behaviour. Detailed instruction should be spelt out to minimize variations in recording observations by different investigators.

- **Training:** Observation is not a haphazard activity. It is a systematic and scientific method that requires skills. Competencies, aptitude, and proper training for observation, must acquire the broad background in the field of the investigator's problem. The investigator should train himself/herself to counteract his/her emotional and intellectual biases in order to report accurate observation. For this purpose, he/she may get rigorous training on similar problems. He/She should develop keenness and alertness to identify minor incidents in observation. The investigator should make comprehensive and complete notes of all pertinent incidents.
- **Precise:** The investigator should make his/her observation in precise, concrete and unambiguous form. His/Her description should mean the same thing to other investigators as they mean to him/her. It will be more reliable if the investigator describes his/her data quantitatively because numerical measures are more precise than words which make possible further treatment of the problem by statistical analysis.

2.6 INTROSPECTION METHOD

Historically introspection is the oldest method which was formerly use in philosophy, and then in psychology to collect data about the conscious experiences of the subject. Introspection means self-observation. It may also be explained as 'looking within oneself to experience one's own mental state'. This method was developed by structuralists in psychology who defined psychology as the study of conscious experiences of the individual. For them, introspection was a process of examining one's own mental process of thought, feelings and motives. The individual introspects, observes, analyses and reports his/her own feelings. For example, when you are angry, you introspect your own mental feelings and examine the mental process in this state of anger.

Merits of Introspection Method

The merits of introspection are as follows:

- William James emphasizing on the importance of introspection as a method of collecting data remarked, Introspective observation is what we have to rely on first and foremost and always. The word "introspection" needs hardly to be defined—it means, of course, looking into our own minds and reporting what "we there discover". Everyone agrees that "we there discover" states of consciousness. So far as I know, the existence of such states has never been doubted by any critic, however skeptical in other respects he may have been. Thus, we see that introspection is an important method of collecting data that has been used from the beginning of psychology as a separate subject.
- This is the easiest method which is readily available to the individual. Individual can at any time introspect about his/her mental state without involving the use of any apparatus and without incurring any expenditure.

Check Your Progress

8. Name a few types of observation.
9. What role does a psychologist play in 'participant observation'?
10. What are the two basic errors related to observation method?

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- According to Stout, in introspection we are concerned with the nature of experience itself and with the laws of the mental process. The observer in introspection is directed towards the answering of questions of theoretical importance for the advancement of our systematic knowledge of the laws and conditions of the mental process.
- Introspection has its historical importance. It generated research that gradually resulted in the development of more objective methods. Introspection is still used in all experimental studies.
- Further, introspection is the observation and reporting of one's own mental processes it is considered important on account of its unique nature. It is a simple and readily available method. One's mental processes are always present and can be introspected at any time. Introspection is, therefore, able to give us a direct and immediate insight into one's own mental processes without involving any extra expenditure of material or apparatus.
- Moreover, introspection provides adequate knowledge of the inner or covert experiences and thus the inner behaviour of an individual. Thus, thought or feeling can be revealed through introspection.

Demerits of Introspection Method

The demerits of introspection method are as follows:

- The most serious objection against introspection is that human beings are not static inanimate objects, such as stones or chairs, etc. Human mental process undergoes constant changes. So, when one attempts to introspect, the state of mental process disappears and it becomes a retrospect. It is difficult to introspect perpetually changing psychological experiences.
- The subject of experience is divided into two halves in the process of introspection. The mind is directed inward towards its own working and is required to attend to them. The attention is divided into two parts. One is the mental operation itself that is to be observed, and the other is the object to which this mental operation is directed. To expect any individual to attend the workings of his/her own mind during a mental process, especially in a complex or emotional state, such as anger or fear, is a mistaken idea. Ross commenting on the limitation of introspection method said, 'the observer and the observed are the same, the mind is both the field and the instrument of observation'.
- The data collected by introspection is highly subjective. There is no way to prove the reliability of the data. It is practically impossible to explore the mental process of others. There is no independent way of checking the contents of another person's mind.
- There are conflicting reports, as regards the findings collected from different introspections on the same experience under the same conditions.
- Influence of preconceptions is always present in introspection. It has the danger of being biased and rendered unreliable even in adults when they are at such a level of mental development that they would unconsciously put in personal knowledge in introspection. The reporter can deliberately lie and hide the facts to mislead the experimenter.
- Introspection cannot be applied to children, animal and abnormal people. It requires highly trained and skilled workers to introspect.

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- The Gestalt psychologists have raised a very valid objection against introspection that it analyses experience into images, sensation and feelings. It does not yield adequate representation of the unitary experience in its totality which, if reported strictly in terms of these elements, would not convey a clear idea of the experience to another person. It is an elemental approach to study human thought process.
- Qualitative estimates are hard enough to handle, but when it comes to subjective data for the purpose of analysis and statistical treatment, the types of scales available are severely restricted, and it is doubtful whether any genuine measurement for the verification of introspective reports is possible.
- Kant, a famous philosopher, pointed out a major methodological barrier in introspection that it was not possible to accept conscious experience as the subject matter of psychology, and at the same time to accept introspection as its proper method. For Kant, the difficulty was that introspection could not introspect the introspective activity, that is be the subject, action and object, all at the same time.

Thus, if we try to evaluate the introspection method, we find that it is based on self-speculation, lacks reliable communicability, replicability and reasonable exactness or precision. It is neither sufficiently scientific and practicable, nor simple. It cannot, therefore, be taken as an adequate or single method of psychological studies. The conclusion arrived at by this method needs to be supported by specific findings through some other objective and reliable method.

ACTIVITY

Research on the Internet and construct a flow chart on the merits and demerits of observation method.

DID YOU KNOW

Although the clinical psychologists and psychiatrists share similar fundamental aim i.e., the treatment of mental disorders; their outlook, training, and methodologies differ. The most significant difference being that the psychiatrists are licensed physicians, whereas the clinical psychologists are not.

2.7 SUMMARY

In this unit, you have learnt that:

- One of the major contributions of behaviourism is the development of the experimental method in order to understand, control and predict behaviour. The experimental method is considered to be a method par excellence for use in certain areas of educational psychology. It is the most precise, planned, systematic and controlled form of observation.

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- The type of control employed in experiment plays an important role in determining the reliability and validity of the conclusions drawn from the experiment.
- Generally, researchers use two parallel group techniques to see the effects of an independent variable on some dependent variable. Two groups are equated on the basis of significant variable. One group is known as the experimental group and the other is called the control group.
- A matched two group design is a modification of the totally randomized two group design—pre-test and post-test. In this design, both groups are matched in terms of some variable, the experimenter feels he/she would influence the dependent variable.
- The procedure for carrying out one-way analysis of variance (ANOVA) is the same as for two group designs. The distinguishing feature between the two types of investigation is the type of statistical analysis used.
- In all large N group designs, the number of subject is large and is divided into two groups; and in this group design, it is not always applicable in a classroom situation.
- Studies in the field of educational psychology make extensive use of the statistical survey, which is based on sampling by direct observation.
- Differential method makes use of various techniques of collecting data such as tests, questionnaire, observation, interview and use of statistics in analysing the data.
- The differential method is also named as the normative survey method or the field survey method as the investigator has to go to the field to make his/her investigations. It is sometimes called the statistical method for the reason that statistical techniques become the major devices for the study of individual differences.
- There are three broad categories of survey method that share the common feature of carrying out their observation on samples of individuals, which are regarded as representative of the larger population to which they belong. The three categories are: (i) field study, (ii) developmental survey, and (iii) differential survey.
- The clinical method is primarily used to collect detailed information on the behaviour problems of maladjusted and deviant cases. The maladjustment may be in the form of anti-social behaviour, emotional disturbances, or backwardness in the area of learning and socio-economic environment.
- The complete and detailed study of a case may involve the use of observation, interview, medical examination; and use of various tests of intelligence, personality, aptitude, interest, etc., the clinician collects the material about the case in totality. The past and present experiences, conditions in home, school and society are given due importance.
- Clinical case study method is specifically followed in learning difficulties, emotional disturbances, delinquency and other behaviour problems. The developmental history is reconstructed from the memories of the case (individual), family and friends. The preparation of a case study is not the work of a single individual, but a combined venture of the social workers, teachers, parents, doctors and psychologists.

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- Continuous developmental studies are time-consuming, so psychologists have recorded substantial segments or sampling of behaviour throughout the principal developmental periods of the child.
- Observation method produces one of the basic elements of science, i.e., facts that are collected by observing the overt behaviour of the organism in order to locate underplaying problems and to study developmental trends of different types.
- In natural observation, we observe the specific behavioural characteristics of children or adults in natural settings. Subjects do not become conscious of the fact that their behaviour is being observed by someone. The teacher can observe the behaviour of his/her students on the playground or in any other social situation when students may not become conscious of his/her presence.
- The observation may be influenced by the observer's perception of the situation when he/she makes inferences on the basis of scanty sensory cues. It suffers from impressionism, prejudice and distraction, etc. It has also been found in some studies that strong personal interests tend to make the researcher see only those things, which he/she wants to see.
- The use of a mechanical device, such as a camera or a tape recorder, may be made to improve the reliability of observation. A system of notation, or shorthand, may be used for recording purposes.
- Introspection method was developed by structuralists in psychology who defined psychology as the study of conscious experiences of the individual. For them, introspection was a process of examining one's own mental process of thought, feelings and motives.
- The scientific method may be compared to a powerful and practical torchlight in the hand of the researcher, lighting his/her path towards the discovery of new knowledge and inventions for the welfare of the society. It is one of the most promising instrument that a man possesses for understanding, controlling and predicting behaviour and other phenomena of nature. It develops human understanding and increases the accumulation of tested and verified.
- The term 'scientific method' has been use in different situations convening various meanings according to the analysis of a problem, which is based on four basic assumptions:
 - (i) empiricism
 - (ii) determinism
 - (iii) parsimony
 - (iv) testability.
- J.S. Mill's doctrine on scientific enquiry says that it is legitimate to start from observation of a large number of cases in order to find the generalizations or laws that fit them. His logic recognizes all sorts of universal propositions or generalizations obtained in all sorts of way from experiences.

2.8 KEY TERMS

- **Determinism:** States that there is law and order in the universe; and that physical and all other phenomena can be explained in terms of cause and effect
- **Empiricism:** To view the causes of a phenomenon; implies the testing of a statement and examining the speculative, superstitious and hearsay statements developed in the past as scientific statements
- **Experimental design:** A procedure for assigning subjects to experimental conditions and selecting an appropriate statistical procedure
- **Factorial design:** Employed where more than one independent variable is involved in the investigation.
- **Field experiment:** A scientific investigation carried out in the field, which involves the direct manipulation of some independent variables
- **Introspection:** Process of examining one's own mental process of thought, feelings and motives
- **Observation:** One of the important and basic methods for collecting data in almost all types of research studies
- **Overt behaviour:** Manifestation of cover conditions within the organism; gives clueS to the mental condition of an organism

2.9 ANSWERS TO 'CHECK YOUR PROGRESS'

1. Experimental designs can be divided on the basis of two important factors, i.e., the control procedure and the number of groups involved in an experiment.
2. The experimental group is subjected to a certain experience or to a specific treatment, whereas the control group is not given any type of special treatment.
3. The Gestalt psychologists criticize the experimental method because of its quantification aspect. They criticize the inappropriate, imprecise and faulty apparatus of psychologists. It is not possible to construct tools that will make accurate and sufficiently discriminating measurement of individual differences.
4. Differential method, also known as Survey method, is used to study individual differences among students.
5. Clinical method (case study) involves the individual, whereas developmental survey studies involve typical patterns of change in the growth and decline of behaviour over a specific period of lifespan of a group or an entire population.
6. Clinicians generally use two different procedures to develop case study, which are: (i) clinical case study, and (ii) developmental case study.
7. The longitudinal approach to developmental case study technique can be used to study physical, mental, language, interest, emotional, and social developmental characteristics of children.
8. Observation may be of the following types: direct and indirect, natural and artificial, scheduled and unscheduled, participant and non-participant.
9. In participant observation, the psychologist establishes perfect rapport with a group of adolescents so that they may not become conscious of his/her presence and may not hide their actual behaviour.

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10. Observation is subjected to two kinds of errors—(i) sampling error and (ii) observer's error. The first error occurs because of inadequacies of selecting the situation to be observed. The observer's error may be due to the knowledge and background of the situation to be observed. Sometimes, the observer is not familiar with the total situation and hence may commit error.

2.10 QUESTIONS AND EXERCISES

Short-Answer Questions

1. What are the merits of the 'experimental method'?
2. What do you understand by 'laboratory method'? Give an example.
3. What are the three possible sources of errors in case of differential method?
4. What are the limitations of 'clinical case study'?
5. Write a short note on the concept of 'developmental case study'.
6. What are the limitations of 'participant observation'?

Long-Answer Questions

1. Differentiate between 'one group design' and 'two group design' with examples.
2. Elaborate on the limitations of the 'experimental method'.
3. 'There are three broad categories of differential method that share the common feature of carrying out their observation on samples of individuals.' Elaborate.
4. 'Clinicians generally use two different procedures to develop case study.' Explain.
5. Give a detailed account on the observation method of educational psychology.
6. Write a short note on Introspection Method.

2.11 FURTHER READING

- Thorndike, R.L.; *Measurement and Evaluation in Psychology and Education*, Wiley Eastern Limited, New Delhi, 1970.
- Anastasi, A., and Urbina, S.; *Psychological Testing*, 7th edition, Prentice Hall of Private Limited, New Delhi, 1997.
- Gelder, M., R. Mayou and P. Cowen; *Shorter Oxford Textbook of Psychiatry*, Fourth edition, Oxford University Press, Oxford 2004.
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UNIT 3 GROWTH AND DEVELOPMENT

Structure

- 3.0 Introduction
- 3.1 Unit Objectives
- 3.2 Meaning of Growth and Development
- 3.3 General Principles of Growth and Development
- 3.4 Stages of Development
 - 3.4.1 Dimensions of Development at Early Childhood Stage
 - 3.4.2 Dimensions of Development at Later Childhood
- 3.5 Dimensions of Adolescent Development
 - 3.5.1 Theories of Adolescence
 - 3.5.2 Physical Development
 - 3.5.3 Mental Cognitive Development
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 - 3.5.5 Social Development
 - 3.5.6 Moral Development
 - 3.5.7 Education of Adolescents
- 3.6 Theories of Child Development
 - 3.6.1 Psychoanalytic Theory
 - 3.6.2 Behavioural Theory
 - 3.6.3 Cognitive Theory
- 3.7 Developmental Tasks and their Educational Implications
- 3.8 Heredity and Environment and their Educational Implications
- 3.9 Summary
- 3.10 Key Terms
- 3.11 Answers to 'Check Your Progress'
- 3.12 Questions and Exercises
- 3.13 Further Reading

3.0 INTRODUCTION

A teacher needs to study the growth and development of learners as he/she has to deal with learners of different socio-economic and cultural backgrounds. The teacher as an agent of the society is responsible to bring desirable changes in the behaviour of a learner so that he/she may shoulder the responsibilities of a good citizen to accelerate the process of national development. The other reason to study development is its continuity from the past to the present, and present can be understood better in terms of its past history.

Prior to joining a school, the child accumulates enormous experiences in his home and neighbourhood environment which are very useful to start formal education in an effective way.

Individual differences among children play an important role in education. The teacher must know the potentialities and capacities of each and every child of his/her class so that he/she may exploit them to the maximum for the benefit of the individual and the society. The teacher must know the basic principles of growth and development and the characteristics which emerge at different age levels in various developmental dimensions to provide effective guidance for the harmonious development of children.

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In this unit, we will discuss the basic concepts of growth and development, along with a special coverage on theories of child development and various dimensions of adolescent development. The unit gives due coverage to developmental tasks, heredity and environment and their educational implications.

3.1 UNIT OBJECTIVES

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

- Explain the meaning and nature of growth and development
- Discuss the general principles of growth and development
- Describe the features of various stages of development
- Explain the theories of physical, cognitive, emotional and moral developments of children
- Paraphrase the theories of physical, cognitive, emotional and moral developments of adolescence
- Identify the importance of heredity and environment and analyse their educational implications

3.2 MEANING OF GROWTH AND DEVELOPMENT

Growth and development have been interchangeably used by most of the developmental psychologists because both the processes are interrelated and interdependent on each other. It is difficult to differentiate the contribution of either of them in the development of the personality of an individual. However, some psychologists define growth as an indicative of increase in bodily dimensions; height and weight which are generally confined to quantitative changes. Arnold Gessell, an American child psychologist, wrote,

‘... Growth is a function of the organism rather than of the environment as such: The environment furnishes the foil and the milieu for the manifestations of development, but these manifestations come from inner compulsion and are primarily organized by inherent inner mechanics and by an intrinsic physiology of development. The very plasticity of growth requires that there be limiting and regulatory mechanisms. Growth is a process so intricate and so sensitive that there must be powerful stabilizing factors, intrinsic rather than extrinsic, which preserve the balance of the total pattern and direction of the growth trend. Maturation is, in a sense, a name for this regulatory mechanism.’

Development can be defined as the emerging and expanding of capacities of the individual to provide greater facility in functioning, such as development of motor ability from uncertain steps to proficiency in games. Development as a matter of fact is achieved through growth.

Development refers to interactions of a person and his/her environmental surroundings whose after-products alter existing response tendencies in such a way as to increase: their strength, the degree of differentiation, and the organization of personality.

Development refers to those effects upon the person's cognitive-emotional systems which strengthen or enlarge one or more of them, increase their number or

interrelate them in some different way. In brief, development is confined to qualitative changes in the organism.

The process of development has been explained on the basis of different viewpoints. Some of them are as follows:

1. **Development as maturation:** According to the famous child psychologist, Arnold Gessell, the role of physical changes is important in development. The development from infancy to adolescence is governed by physical changes that are mapped out in the individual's genes. For instance, a growing nervous system changes systematically and automatically; and this results in predictable changes in bones and muscles. He used the word maturation to describe growth processes that are governed by such automatic and genetically determined signals. He believed that most major changes in the organism are based on maturation.
2. **Development as learning:** Baer has defined development as ‘behaviour change which requires programming; and programming requires time, but not enough of it to call it age’. Here, programming refers to sequences of learning which may happen naturally or may be arranged in the life of an individual. Development, in this view, is a collection of learning experiences which the child acquires in the process of interaction with his environment.
3. **Development as synthesis:** Piaget says, ‘For some psychologists development is reduced to a series of specific learned items and development is thus the sum . . . of this series of specific items . . . In reality development is the essential process, and each element of learning occurs as a function of total development rather than being an element which explains development.’

According to Piaget, there are four basic elements in development: (i) Maturation; (ii) Experience; (iii) Social transmission (learning through language, schooling or training by parents); and (iv) Equilibration.

Distinction between growth, development and maturation

Growth refers to a process of becoming larger or longer or more numerous or more important, largely a physical change. Development, on the other hand, is a process in which something (mostly positive) transforms into a different stage or improves. Growth is taken to mean an increase in the size of an object or a living being. ‘The lump as grown in size’ is an example of its usage. Development is taken to mean an improvement in the level of functioning. ‘He developed into a nice officer’ is an example of its usage.

Development may mean a kind of improvement in the condition of health. ‘He developed a better pulse rate now’ is an example. Growth describes the process of growing. ‘There was a rapid growth in the economy of the country’ is an example. It indicates an increase in value. ‘There was a growth in the number of hospitals in the city.’ Growth can mean an increase in a crop or yield of some fruit for that matter. ‘The farmer was amazed with the tremendous growth of grapes’. Development may mean a process of gradual transformation. You can use the word ‘development’ to suggest a process of developing.

Development is experiential change. It is orderly, adaptive and durable changes that occur throughout our life. Maturation, on the other hand, is naturally occurring change that is genetically controlled.

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Some developmental changes are considered maturational, or indicators of physical maturity. Maturation is the progression of developmental changes toward the characteristics of adults. Physical maturation occurs from the time of conception, but some of the most commonly recognized indicators of maturation become apparent during adolescence. Changes in body shape, breast development in girls, pubic hair development in both genders, and development of facial hair in boys are visible indicators of maturation toward adult appearance of the body. The cessation of the growth of long bones, associated with the final attainment of adult stature is also a maturational event.

Although growth and maturation are certainly related, distinguishing between them is important because some physiological and hormonal processes affect growth and maturation differentially, as do some diseases. It is easy to observe that children of the same size can differ in maturational status and that fully mature individuals (adults) can be of different sizes.

Development leads to change

- Growth refers to quantitative changes—increase in size as well as structure
- Development, by contrast, refers to qualitative changes. It is a progressive series of orderly, coherent changes. Progressive means that changes are directional, which lead forward rather than backward.
- *Goals of developmental changes:* self-realization or achievement of genetic potential.

Types of changes in development:

- A human being is never static and is always undergoing changes.
- Changes are antagonistic: On one hand, there is positive growth, such as gaining maturity with experiences and on the other, there is atrophy and decay of the human body as it grows older.
- Changes are interrelated: Changes never occur in isolation. They are in the form of size, altered proportions, and disappearance of old and acquisition of new features.

Early development is critically important more than later development

- As per Freud, maladjustments lead to unfavorable child experiences. The more recent studies carried out on this aspect substantiate this theory.
- As per Erickson, babyhood is a time to 'build trust or distrust'—here, the individual learns to view world as safe, reliable and nurturing or threatening and unpredictable.
- *Conditions affecting early childhood foundations:* Favourable interpersonal relations, emotional states, child-training methods, early role play, childhood family structure, and environmental stimulation.
- *Early foundations:* Early learning and experience play a big part and family should take part in the learning. Early foundations quickly develop into habitual patterns and will have a lifelong influence. Contrary to popular belief, children do not outgrow undesirable traits as grow older. Therefore, it is recommended to ensure that early learning is geared towards developing desired traits.

Maturation and learning both result in development

- Meaning of maturation: It is the unfolding of characteristics potentially present in the individual that come from the individual's genetic endowment.
- Phylogenetic functions – common to race
- Ontogenetic functions – common to individual
- Meaning of learning – Development that comes from exercise and effort
- Importance of readiness to learn – interest in learning and sustained interest will gradually lead to improvement.
- Effects of maturation and learning interrelationships: Variations in pattern of development, maturation sets limits to development, maturational limits are rarely reached, deprivation of learning opportunities limits development. Stimulation is essential for full development and effectiveness of learning depends on proper timing.

Nature versus Nurture

The nature *versus* nurture debate concerns the relative importance of an individual's innate qualities *versus* personal experiences in determining or causing individual differences in physical and behavioural traits. The view that humans acquire all or almost all their behavioural traits from 'nurture' is known as *tabula rasa* ('blank slate'). This question was once considered to be an appropriate division of developmental influences, but since both types of factors are known to play such interacting roles in development, many modern psychologists consider the question naive—representing an outdated state of knowledge.

In the social and political sciences, the nature *versus* nurture debate may be contrasted with the structure *versus* agency debate (i.e., socialization *versus* individual autonomy).

3.3 GENERAL PRINCIPLES OF GROWTH AND DEVELOPMENT

The following are the general principles of development:

1. **Development is a product of the interaction:** Development is a process resultant from a constant flux or interchange of energy within an organism and his environment. Hereditary forces inherent in the genetic constitution of the individual and environmental forces influence the development of the organism. It is very difficult to distinguish the contribution either of the two forces. An individual is a by-product of its constant interaction with its environment.
2. **Development follows an orderly sequence:** Individuals differ in rate of growth and development. However, development follows an orderly sequence in all individuals and shows high degree of similarity in the order in which various developments appear. Psychologists have reported several directional trends in the development. Following are the main trends:
 - (i) *Cephalo caudal:* Development starts from head and proceeds towards heel.
 - (ii) *Proximodigital:* Development starts from the centre line of the body to the outer parts, more distant, from it.

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Check Your Progress

1. Define the term 'development'.
2. What are the basic elements of development as identified by Piaget?
3. What are the main directional trends in the development of an individual?

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- **Language development:** The language development of the infant begins from birth cry. The ten-month-old child is able to use one word; but by the end of the first year, its vocabulary increases to 3 or 4 words. Good home environment and early childhood training help in the development of vocabulary. It has been reported by several studies that there is positive correlation between intelligence and language development.
- **Intellectual development:** The intellectual development of the child is accelerated after the age of two because now he/she begins to explore his/her social environment and acquires new experiences.
The following are the major characteristics of intellectual development:
 - o Child begins to form concepts of physical and social reality;
 - o By the age of six the child develops perception of size, shape, colour, time and distance, etc.;
 - o Memory increases at a very rapid speed. The child can learn by rote memorization;
 - o Creativity develops in children and imagination begins to grow;
 - o Thinking and reasoning develops in relation to concrete material; Span of attention increases from 7–20 minutes and interest in exploring the environment increases;
 - o The child is now able to use symbols in language, draw symbolic play and engage in problem solving; and
 - o The child asks questions about his/her environment.
- **Social development:** A child is born in a social environment where his/her personality development is shaped in accordance with the norm of the society:
 - o Sense of trust and mistrust develops in children themselves and their environment;
 - o Feeling of autonomy develops in children. They begin to explore their environment independently;
 - o Social environment expands beyond home;
 - o Children of both sexes play together without any discrimination. They actively participate in group games in which physical energy is used such as hide and seek;
 - o They learn to cooperate with others and make friends on shared interests and similar personality traits;
 - o Children take interest in fairy tales and animal stories;
 - o Negativism increases between the years three to six. It is a product of social situations. It is said that the more the child is frustrated by adult interference, the more negativistic his/her behaviour will be;
 - o Girls are more dominating than boys in play situations;
 - o The child seeks social approval of his/her action.
- **Emotional development:** Emotions play an important role in life and contribute in the personal and social adjustment of the individual provided they are directed into wholesome expression. Emotions have the following effects on the developing individual:
 - o Emotions give us energy to face a particular situation in life;
 - o Emotions work as motivators of our behaviour;
 - o Emotions add pleasure to our everyday experiences in life;
 - o Emotions maintain our interest in work;

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- o Emotions influence our adjustment in the society;
- o Highly emotional conditions disturb our mental equilibrium, reasoning and thinking;
- o Emotions serve as a media of communication between individuals and guide the individual to modify in order to conform to the social standard; and
- o Emotional deprivation leads to personality maladjustment.

3.4.2 Dimensions of Development at Later Childhood

Later childhood is an important phase of life. Redl has characterized this period as the time 'when nicest children often begin to behave in the most awful way'. The parents and teachers are annoyed with children and vice versa. It is a period which requires proper guidance and counselling by parents and teachers for the adequate adjustment of children in the society.

Different types of development during later childhood are discussed as follows:

Physical development

There is slow increase in weight and height during late childhood. Girls are ahead of boys by two years. Changes are shown in all general proportions of the body. Children are free from diseases at this age. Physiologically, the girls at the age of 11 are a full year ahead of the boys. Shedding of milk teeth and growth of permanent teeth changes the appearance of mouth; flattening of forehead, sharpening of the nose, broadening of the chest, and motor skills develop through play.

The following are the marked physical changes during the later childhood stage.

- Increased manual dexterity;
- Increased strength;
- Increased resistance to fatigue; and
- Increased accuracy and endurance in relation to games

Intellectual development

The following changes in the intellectual development occur during the period—6–12 years of age.

- The child begins to make clear distinction between himself/herself and the outer world. He/She seeks reality in his/her environment.
- The concept of natural laws becomes almost fully developed by 12 years of age.
- It is the time for eager absorption of information and ready accumulation of ideas. Learning and memory become more efficient because the child enters formal schooling.
- Capacity for logical thinking increases. The child becomes increasingly efficient in selecting, developing and applying cognitive operations in relation to concrete objects.
- Interest in science stories and mechanical operations reaches its height at this age.
- Courage and loyalty increase. Children show courage in doing things.

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- Imaginative plays are given preference to.
- Use of reading of factual material, scientific and mathematical information, and fiction, with a realistic theme increases.
- Use of causal relationship in thinking about physical, mechanical, and natural phenomena in the environment increases.
- Early imaginative fears disappear by the age of 12.
- High ability to generalize is shown by children of 10–12 years of age. Children are more concerned with immediate cause-and-effect relationship and current happenings.
- Flavell (1977) has suggested that the mind of the child during this period has a better general understanding of problems. The child has a much better sense of what a conceptual problem is. He/She can rationally analyse a problem. He/She is able to deal with the environment in a flexible, efficient and symbolic manner. The child has at his/her disposal a set of operations or rules that are logical although concrete.

Emotional development

Emotions are very important for life. Without emotions life becomes monotonous and dull. They change with the age of the child.

The following are the characteristics of emotional changes during this period:

- Early pattern of emotional expression changes. By the end of late childhood the child learns to control his/her emotional expression in social situations.
- The emotional responses of the child become less diffuse, random and undifferentiated.
- Emotions are expressed even in the absence of concrete objects.
- Emotions are most contagious during childhood, because children are highly suggestible and dependable on others.
- Early childhood fears of animals, high places and noise disappear and fear of supernatural, imaginary creatures, fear of failing, being ridiculed and being different appear.
- Anger is caused by thwarting, teasing, making unfavourable comparisons with other children, interruption of activities in progress, ridicule by peers or elders, and negligence, etc.
- Parental favouritism causes jealousy in childhood.
- Joy, pleasure, love, curiosity, grief and affection appear in childhood.

Social development

The process of socialization confines to home and neighbourhood environment in early childhood, but as the child enters school his/her social circle widens.

The following are the major changes:

- It is the period when children form peer group of their own sex and remain outside the home. Peer group becomes an important agent of socialization.
- It is the period of peak unruliness in school and home.

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- Complaints of disobedience are highest in percentage during this period.
- Children reject adult standards and circle of friends widens.
- Delinquency begins more during this period than adolescence.
- Sex differentiation becomes sharp. Girls play with girls and boys play with boys. There is sex difference in play activities. Girls are more antagonistic towards boys.
- Boys are more rebellious than girls and their groups are more organized than the groups of girls.
- Children take interest in group games. Boys and girls form their own groups. Group consciousness develops and the child becomes less selfish, self-centred and aggressive but more cooperative and outgoing.
- Social consciousness develops very rapidly. It is called 'gang age' period when the child associates himself/herself with the peer group of the same age who feel and act together. The child shows great loyalty to his/her gang. He/She conforms to the stand of his/her gang.

3.5 DIMENSIONS OF ADOLESCENT DEVELOPMENT

Adolescence is the most important period of human life. Poets have described it as the spring of life of human beings and an important era in the total lifespan. The word "adolescence" comes from a Greek word "*adolescere*", which means "to grow to maturity". A number of definitions have been given by psychologists from time to time. Some psychologists define it as the transitional period of life. The child experiences a number of changes in this transitional period. The period runs between childhood and adulthood, and is sometimes called the "period of teenage".

According to A.T. Jersild, 'adolescence is that span of years during which boys and girls move from childhood to adulthood, mentally, emotionally, socially and physically'.

Some psychologists believe that it is the period when an individual is capable of begetting offspring. It means that when power of reproducing its own kind is attained by the individual, we can say that he/she has become an adolescent.

Dorothy Rogers defines adolescence as, 'a process rather than a period, a process of achieving the attitudes and beliefs needed for effective participation in the society'.

Adolescence starts with puberty. Usually, puberty starts between ages 10–13 in girls and 12–15 in boys. During puberty, your body will grow faster than at any other time in your life, except when you were a baby. A boy or a girl at birth and before puberty can be distinguished from the sex organs. Sex organs are necessary for reproduction, therefore, they are called the primary sexual characteristics.

At the onset of puberty, physical changes and development that are not directly part of the reproductive system, but distinguish the male from the female are called "secondary sexual characteristics". The changes at puberty can be studied under three headings: (1) development of secondary sexual characteristics, (2) development of sex organs, and (3) intellectual, emotional and psychological development.

Check Your Progress

4. List out the major stages of human development.
5. What are the distinct physical changes during later childhood?

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Significance of the study of adolescence

Adolescence is the most important period of human life. A major part of a country's population ranges between the ages 13 to 21 years. The country's success in various fields of life depends on the proper guidance of adolescents. The significance of the study of this period may be discussed under the following heads:

- **Better understanding developmental characteristics and problems:** Every teacher and parent must know about the nature and changes emerging in transition period from childhood to adulthood. It is also necessary for them to be familiar with causal factors of the problems of adolescents so that proper individual, educational and vocational guidance may be provided for adequate adjustment in the society.
- **Maintenance of mental health:** The progress of a country depends on the maximum exploitation of its human resources. Sound mental health is one of the first requisite conditions of development. Adolescence is marked with a number of problems which affect the mental health.
- **Adjustment to responsibilities:** The study is significant to provide the knowledge of needs and developmental tasks for adolescents. Parents and teachers can help adolescents to adjust to their responsibilities. By understanding the needs of adolescents, the teacher and administrator can frame appropriate curriculum, school policies and methodology of teaching them.
- **Rise in curiosity:** To study the psychology of adolescent may be a desire to know something about oneself. Such a desire is quite justifiable and understandable if the student is in the adolescence period. But it is also a sound motive for an older person. The older person who studies adolescence has within himself/herself a potential source of insight into issues facing the person of adolescence period—issues that once he/she had to face. It may also be due to the scholarly interest of the individual.
- **Better planning curriculum and education:** The needs, interests, aptitudes and changes occurring during adolescence are very important and useful for teachers, principals and guidance workers for planning education, curricular and co-curricular activities, and for developing proper instructional material.

Fallacies about adolescence

A systematic study of adolescence started with the classic work of G. Stanley Hall in the beginning of the 20th century. Prior to the study of Hall, some misconceptions regarding adolescence prevailed in society; some of them still exist even after scientific contradiction and disapproval. These misconceptions are listed below:

- The *first* fallacious view is that adolescents are awkward in physical appearance
- The *second* misconception is that adolescents are rebellious
- The *third* misconception is that adolescents grow rapidly
- The *fourth* fallacious view is that adolescents are bothered by sex maturation and its problems.

3.5.1 Theories of Adolescence

Important theories of adolescence are discussed as follows:

1. **Comenius and Rousseau's Views:** Comenius was the first philosopher who recommended that schooling should be divided into four-to-six yearly periods. The periods proposed by him are as follows:

- The *first* period of schooling should provide training of different senses;
- The *second* period of schooling should provide education for memory;
- The *third* period of schooling should encourage understanding and judgment ability in children; and
- The *fourth* period of schooling should concentrate on harmonizing the 'will'.

The theory has been elaborated in great detail by Rousseau in his book *Emile*. The theory of Rousseau exercised a great influence upon educational thinking and practices in several countries for centuries. The theory still has impact on stages of childhood and education.

Psychologists criticize his/her theory on the basis that it was purely philosophic in nature. It was not based on observation and experiments. He/She was neither a successful teacher nor a devoted parent. However, he/she succeeded in drawing the attention of educationists to the need for basing education in accordance with the nature of child.

2. **Hall's Theory:** The first psychologist who devoted much of his time in collecting data on adolescence was G. Stanley Hall. He stands half way between the philosophic fiction of the past centuries and the controlled observation and experimental approach of the present time. He analysed the self-expression of children and adolescents through essays and directed interviews.

He wrote two volumes in 1904 on psychology of adolescence. He wrote:

'The years from 8 to 12 constitute the unique period of human life. Height and weight are at their full—health is at its best. Activity is greater than even before. The child develops his own circle out of home—he develops peculiar endurance and resistance to fatigue. There is greater immunity to exposure, danger and accident. The development is saltatory. It is a period of storm and stress. Important functions previously non-existent arise—every step of the upward way is strewn with wreckage of body, mind and morals. Sex asserts its mastery in field after field and works its havoc in the form of secret vices. The social instincts undergo sudden unfoldment and the new life of love awakens. Everything is plastic. Character and personality take form. Self-feeling and ambitions are increased. It is all marvellous new birth.'

The findings of G. Stanley Hall had a great influence on the educational literature of the US.

3. **Hollingworth's Theory:** Hollingworth who conducted surveys on the developmental characteristics of children holds a different view than that of Hall's view. She holds the view that growth is a continuous process. Changes in adolescence do not occur all of a sudden but in a gradual way.
4. **Theory of Sigmund Freud:** Freud was a prolific writer on human behaviour and its problems. He developed a new concept of unconscious motivation which revolutionized the theory and practice of psychology. His main emphasis was on sex. Freud developed distinct stages of psycho-sexual development of human personality. He shared Hall's attachment to past theories in his assumption of

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complete discrepancy in the characteristics of man and woman. Freud's whole interpretation of human nature was based upon the consequences which followed from an explanation of social functioning in terms of the rivalry of brothers for overthrowing of the father in his possession of the mother. He did not agree with G. Stanley Hall's concept that sexual instinct had its birth at puberty. Freud held that sex is present in the life of the child from his birth. He developed the theory of psycho-sexual development.

3.5.2 Physical Development

The most important single feature of adolescent development consists of the changes that take place in the young person's body. In adolescence, marked physical changes take place which have significant behavioural implications.

Physical features in adolescence may be discussed under the following heads:

- **Change in height:** Almost all boys and girls show a spurt in growth during adolescence which is preceded and followed by years of comparatively little increase. There is a sudden shoot-up in growth in height.

During adolescence, the height increases by 15–20 per cent. The height depends on the genes that you have inherited from parents. Right kind of diet, exercise and general health during these years also contribute to height.

- **Changes in bodily proportion:** There is general change in the proportions of various bodily parts. The different parts of the body grow at different rates and attain their maximum development at different times. The pelvis bone of girls broadens and their wrist becomes circular. The arms and legs grow in length and become finer. Boys develop round shoulders.
- **Voice:** Both girls and boys are affected by voice changes during their adolescence. In girls, the change in their voice is hardly noticeable because it becomes only slightly deeper. As compared to boys they have a high-pitched voice. In boys, changes that occur in the larynx cause their voices to deepen. The vocal cords of the larynx grow thicker and longer and when they vibrate the voices sound lower and deep. The larynx sticks out as a prominent Adam's apple in males.
- **Secondary sex characteristics:** The secondary sex characteristics develop during adolescence. Genital organs in boys grow in size. Testes usually grow earlier. In girls, sex organs acquire maturity. The growth of breasts and the widening of the pelvis in girls are among the physical developments that have significant influence on the adolescent girls' conception of her physical self.
- **Hair growth:** Both, boys and girls, have a body hair in the armpits (under the arms), in the pubic area (region above the thighs) and on the arms and legs. Boys also begin to grow facial hair, in the form of moustache and beard and hair on chest.
- **Physiological changes:** All internal systems such as respiratory, circulatory, digestive, blood pressure, heart and pulse-rate acquire their full growth. Brain is fully developed by the age of 18.
- **Age of menstruation:** The data on menarche has been collected in all parts of the world. It is generally believed that girls in tropical and sub-tropical countries mature earlier than cold countries. The average age of menstruation varies from 13 to 16 years.

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- **Relationship between physical and mental growth:** It has been shown that the interests and behaviour patterns of children are closely allied with their pattern of physical and physiological development. Physical development has a psychological effect on his/her attitudes regarding himself/herself, and on the attitudes of others toward him/her. The physical development is an important factor in social development and approval. If the girl is ugly and under-developed, she tries to avoid social situations. If the boy is physically handicapped or has some minor physical defects, then definitely his/her intellectual and social developments are affected.

- **Increase in weight:** During adolescence, the weight of a teenager almost doubles as the amount of muscles, fat and bones in their bodies change.

- **Development of muscles:** During puberty, the muscles of the body increase in mass and strength, in both, boys and girls.

- **Distribution of fat tissue:** The distribution of fat in the body changes during adolescence. Boys add more fat to their trunks than to their limbs, whereas in adolescent girls there is increased distribution of fat in both. Among the limbs there is more fat added to their legs than to their arms as a result their waist becomes thin and the hips become more rounded. Adequate physical exercise should, therefore, be a part of daily life of an adolescent.

- **Increased activity of sweat and sebaceous glands:** During puberty, the sweat glands of both boys and girls become more active especially those present in the armpits and groin and on the palms of the hands and soles of the feet. When the sweat comes in contact with bacteria on the skin, it can produce body odour.

- **Acne:** Acne is a common problem among adolescents. It appears in boys and girls around the beginning of puberty. The hormonal changes that are happening inside your body cause the sebaceous (oil) glands to become more active. When the oil glands get infected with bacteria, an outbreak of acne takes place. Most teenagers get acne on the face, neck, upper back, upper chest, shoulders and back.

- **Breast development:** The beginning of breast development is one of the earliest signs of puberty in girls. Breast is made up of fatty tissue and milk glands with ducts. The milk glands produce milk for the newborn child. Some adolescent boys also have breast development which is temporary. The swelling usually goes down within a year or so. In overweight boys, fat may also give the breasts an enlarged appearance.

- **Physical activity and ability:** The capacity to perform physical activities increases rapidly in adolescence.

- **Changes in strength speed:** There is a great increase in muscular strength in adolescence. The adolescents become more active in their work. Girls seem to mature earlier than boys in physical activity.

- **Growth trend in motor performance:** Espenschade conducted a study on boys and girls for a number of years on tests on running, throwing a ball and jumping. There was great difference in the performance of boys and girls. Boys are better. The boys are superior, particularly in activities which involve speed and muscular strength. Boys continue their interest in physical activities, while there is sharp decrease in the interest of girls. There is a sharp increase in

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jumping and throwing events from 13 to 16 years. Many of the sex differences in motor and mechanical activities are not due so much to a genuine sex difference as to a difference in amount of interest, experience and practice.

There is a close relationship between motor performance and other traits. Popularity in adolescence is closely related to physical strength, and skill in athletic activities than to intelligence and school achievement. The cluster of physical traits as physical skills, bravery and strength show a high relationship in social situation and heterosexual relations.

These findings emphasize the importance of physical education and recreational activities for adolescents. The boys who have poor athletic abilities have poor social adjustment. They develop tension and conflict arising from inferiority.

3.5.3 Mental Cognitive Development

Another area of physical development is in the brain, especially the frontal lobe, which is the area for impulse control, judgment, and the ability to plan. The frontal lobe develops during the teens and early 20s. An undeveloped frontal lobe helps explain impulsiveness, risky behaviours, and moodiness among adolescents. In mid to late adolescence, young people often feel the need to establish their sexual identity by becoming comfortable with their body and sexual feelings. Through romantic friendships, dating, and experimenting, adolescents learn to express and receive intimate or sexual advances.

As an adolescent boy/girl grows, he/she develops problem-solving skills and could be a part of decision-making in school or at home. He/She would be able to analyse information and experiences by critical thinking and handle a new situation through creative thinking. The adolescent boy/girl would indulge in planning and goal setting for long-term and short-term tasks. Yet, the same hormones that cause changes in the appearance and intellect can also affect his/her emotions. One may feel awkward and self-conscious at times, confused and insecure at other times. All these are normal feelings and the adolescent boy/girl gradually gets used to such emotions and gets over them.

All studies on the mental growth have reported that mental abilities increase with age. Mental development during adolescence accelerates on many intellectual fronts. The following are the characteristics of mental development in adolescence:

- **Increased ability to generalize the facts:** Children usually generalize in relation to concrete objects. The intellectual development in childhood operates on a perceptual level but in adolescence the ability to generalize in an abstract way on conceptual level develops. The adolescent can generalize in an abstract way.
- **Increased ability to understand:** There is an increase in the ability to see relationship and to solve problems of increasing complexity and difficulty. The adolescent's depth of understanding develops.
- **Increased ability to deal with abstraction:** The adolescents can think not only in general terms, but also in abstract terms to a greater degree than children. They can think in terms of symbols rather than concrete things. Ability to carry on abstract thinking is not something that suddenly develops in adolescence. It is relative. This ability to comprehend and to communicate meanings in abstract qualitative concepts is an important aspect of intellectual maturity in adolescents.

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- **Development of memory and imagination:** The memory in adolescence develops tremendously with the growth in vocabulary. The adolescents can imagine about a situation which is not physically present before them. Their long-term memory increases. They can retain facts for a longer period. They can anticipate future needs and can plan for it.
- **Growth away from trial and error method:** Trial and error is the primitive method to solve problems. During adolescence, an individual develops the capacity to cope with the situations through manipulation of pertinent factors. Teachers should encourage adolescents to develop the habit of substituting thought for trial and error method of solving problems.
- **Ability of problem solving:** The ability to solve problems increases in adolescence. Adolescents can solve problems with the help of symbols. They can deal with ideas that do not represent something in which a person is directly involved. They are able mentally to deal with events in a world that extends far beyond their own immediate sphere of activity.
- **Increased ability to communicate with other persons:** The adolescents on roads, in coffee houses, and tea stalls can be seen arguing for hours on topics of their interest.
- **Identification with conditions and characters in the larger world:** Another important change in intellectual orientation that takes place near the beginning of adolescence appears in the child's ability to identify with the circumstances and people outside his/her own immediate environment.
- **Ability to make decisions:** The individual has to make many decisions in his daily life. Decision-making ability is necessary for successful adjustment in life. During adolescence, we expect the growing child to gain increasing confidence in his/her own opinion. There is a certain amount of independence in thinking, a certain freedom in exploring and in weighing alternatives that is involved in the kind of maturity that enables one to make decisions on his/her own.
- **Understanding of moral concepts:** The child, without questioning the validity of moral training, obeys the moral code framed by parents, but as he enters adolescence he critically examines the moral code and asks a number of questions.
- **Self-criticism and evaluation:** Adolescents begin to evaluate their performance objectively but majority of adolescents do not achieve the mental maturity to do so. They either overestimate or under evaluate their performance.
- **Increased rational self-control:** Adolescents show more intellectual maturity to do a thing. They achieve rational self-control which is promoted by good mastery of developmental tasks which develops the sense of achievement and duty in them.

3.5.4 Emotional Development

C.T. Morgan emphasizing the importance of emotions in life writes that emotions are basic, primeval forces of great power and influence designed by nature to enable the organism to cope with circumstances which demand the utmost effort for survival or success or to add colour and spice to our living.

If there had been no emotion in life of the organism, life would have been without any aspiration. In absence of emotions, social and family life would have

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ceased and progress would have been checked. The word emotion has been derived from the Latin word 'emovere' which means 'to move out'. Emotion may be defined as the stirred up condition of the organism involving internal and external changes in the body. It is expressed in love, fear, anger, laughter and tears, etc. It involves feelings of jubilation or depression and impulse to action and awareness of perception.

Basically, human beings are creatures of feelings or emotions. Our emotions control our behaviour. Emotion in the organism is a dynamic internal adjustment, which operates for the satisfaction and welfare of the individual. Adolescence is marked by heightened emotionality.

Causes of heightened emotionality

The following factors are responsible for increase in emotionality:

1. Change of roles in home, school and society;
2. Unfavourable relations in home;
3. Social expectations;
4. Difficulty in adjustment to the member of opposite sex;
5. Religious conflicts;
6. School failures;
7. Conflicts with friends and family members; and
8. Vocational problems.

Characteristics of emotions in adolescence

The characteristics of emotions in adolescence are as follows:

- **Complexity:** By the time a child steps into adolescence, he/she experiences a number of emotional upheavals and storms. His/Her emotional development becomes complex by his/her experiences with his/her environment. The adolescent learns to conceal his/her true emotional experience.
- **Development of abstract emotion:** Generally, children show emotional expression in relation to concrete objects but adolescents can express their emotional feelings in relation to objects which are abstract or which are not present in concrete form.
- **Widening of emotional feelings:** As the child grows, he/she starts taking account of the past and imagines the future; and thus we can expect him/her to become more patient and able to tolerate delay. The child gets pleasures from what he/she expects in future. The sphere of his/her social relation increases. The child starts appreciating elder and younger people.
- **Bearing of tensions:** Adolescents develop competencies to bear the tensions in different social situations. The emphasis is on self-control. They feel a kind of inner freedom—freedom to feel and experience in an intimate personal way.
- **Capacity of sharing emotions:** In childhood, children are not able to control their emotions. Sharing of emotional experiences reaches its fullest development when an adolescent is able to relate himself/herself to another person in such a way that the satisfaction of the person is just as important as his/her own. It means he/she begins to love his/her neighbours as much as himself/herself.

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• **Expansion of loyalties:** Emotional development begins from the home environment of the infant, and during adolescence it is expanded beyond home and neighbourhood. These loyalties are identified with peers and leaders of various fields.

• **Realism in emotional experiences:** Now the child enters the period of reality. An adolescent can perceive and appreciate people around him. He recognizes the weakness and strength of one's character.

• **Reviewing of hopes and aspirations:** Adolescence is the period of life when one has high hopes and aspirations for his/her future life. Some adolescents work realistically to achieve their expectations and others do little to realize their hopes; they remain in illusion, and in the world of day-dreams and flights of fancy which make them unrealistic.

• **Toleration of aloneness:** The adolescents develop a feeling of loneliness. Sometimes, they like to be alone in their home.

• **Externalization of feelings:** The adolescent learns to externalize his/her feelings in the various situations of external environment he/she moves in. He/She can project his/her feelings on others.

• **Increased compassion:** Compassion means fellowship of feeling. It denotes an ability to enter into kinship with the feelings and impulses involved in any sort of emotional experience, whether it be joy or sorrow. To be compassionate, a person needs to be able to enter his/her own feelings and appreciate the emotional feelings of others.

Effects of emotions

Emotions have a profound effect on the life of an individual. They can make or mar one's life. There are two types of effects of emotions which are described below.

1. Good effects of emotions

- Source of motivation
- Source of enjoyment
- Source of strength and endurance to body
- Media of communication

2. Bad effects of emotions

Emotions also have damaging effects on the behaviour of an individual. The most damaging effect of emotions is on the physique of the individual. Constant emotional tension may cause lack of sleep, restlessness, headache, chronic fatigue, insomnia and lack of appetite.

3.5.5 Social Development

During adolescence, the following changes in social behaviour occur:

- The most marked change in adolescence is the place of the adolescent in family. In India, a special ceremony is held to celebrate the entry of child into a new social role. Parents' attitude changes and now they assign him/her social responsibilities. He/She is taken into confidence on important matters of the family.

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- The circle of adolescent narrows down to a small group. His/Her interests become specialized.
- Adolescents start identifying himself/herself with adults and tries to do roles of the adult.
- In childhood, boys play with boys and girls with girls; while in adolescence, there is heterosexual trend in companionship. The adolescent boys and girls form their groups based on their common interests and goals. The social groups of boys are larger than girls because boys in our society have more freedom than girls. But very recently in big cities, a new trend toward giving more freedom to girls is emerging as a new social pattern among adolescent girls. The adolescent boys and girls have a variety of grouping such as chums, clique.
- Adolescents make friendship with those who conform to their standard and possess the personality traits they like. The number of friends decrease, but the affiliation becomes more permanent. There is interest to make friendship with the members of the opposite sex. The adolescent does not tolerate the interference of parents and other members in selecting friends. Sometimes because of his/her immature decision, the adolescent is bluffed in selection of friends. The friendship of this period tends to be permanent.
- The teacher should make an appraisal of student's social interests, social acceptance in classroom, socio-economic conditions, and organize activities to foster socialization.

3.5.6 Moral Development

The term *moral* is derived from the Latin word *mores* meaning manners, customs and folk ways. Morality is indissolubly linked with the social system. The child has to learn what is *good* and what is *bad*, what is *right* and what is *wrong*. He/She has also to learn his/her *duty*. All these terms imply clearly that morality has reference to social relationship and social process. Morality has two dimensions which are closely interlinked—(i) the rules of morality operate in the social context, and (ii) it is used to mean the pursuit of good life i.e., personal moral code.

Dimensions of moral development

Baqer Mehdi and B.P. Gupta in an NCERT publication entitled, *Psychology of the Child and Curriculum* (1983) observe, 'moral development of the child implies inculcation in the child a number of qualities for which curriculum provides ample opportunities'. According to them, following are some of the important moral qualities which need to be attended to in schools:

- Honesty in words and deeds
- Truthfulness
- Self-respect and a desire to respect others
- Righteousness
- Self control
- Duty consciousness
- Compassion

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Jean Piaget (1932) used the interview method to find out the various stages of moral development of the child. According to him, there are four stages: (i) Anomy the first five years (ii) Heteronomy - Authority (5–8, years) (iii) Heteronomy - Reciprocity (9–13 years) and (iv) Autonomy - Adolescence (13–18 years).

3.5.7 Education of Adolescents

Adolescence is a period of transition from childhood which implies many developmental changes. S.R. Laycock has grouped the problems of adolescents under the following major tasks:

- Adjustment at home, school, society, and with opposite sex;
- Freedom from home;
- Adjustment in suitable vocation; and
- Development of a sound philosophy of life

Charlotte Pope made an extensive study of the problems of adolescent boys and girls, and reported the following areas of problems:

- **Teaching–Learning relationship in school:** Most of the adolescents face a great problem in adjustment with teachers. Teachers are rigid, conservative and do not change their attitude. Some adolescents reported the problem of favouritism by teachers to some students. Students also resent the amount of homework given to them. It is unfortunate that curriculum in India is purely theoretical, and there is hardly active participation on the part of the students. Sitting passive in the class creates annoyance in adolescent boys and girls.
- **Occupational adjustments:** The greatest single problem which bothers the mind of adolescent boys in India is uncertainty for future vocation. The problem what to do after study haunts the minds of unemployed adolescents. There is another black side of the picture when an adolescent sees thousands of unemployed adolescents. The mind of the adolescent agitates against the social order, and he/she becomes rebellious. It is further unfortunate that most of the adolescents study without future planning. When they finish their study, the adolescents find themselves incapable of taking any independent means of livelihood.
- **Financial problem:** The problems of adolescents have multiplied with the socio-economic development of the country. The problem of money is a big issue. There are many activities of adolescents which involve money. The adolescent needs money. He feels ashamed of begging money from parents. Parents are conservative in providing money for extra activities to their sons and daughters.
- **Home life relationship and social adjustment:** Adolescents want more freedom to attend social functions, but parents do not permit them to move outside the home. This is particularly more so in case of girls from rural areas. The second important problem happens to be parents' high aspirations regarding achievement of their sons and daughters, and when they do not come up to their aspirations there is constant quarrelling among parents and adolescents.

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There is lack of understanding between parents and adolescents, regarding freedom and money. The parents treat the adolescent like a child. They never discuss problems freely with them.

- **Health adjustment:** Both boys and girls are very particular regarding their physical appearance. Those adolescents who are either underdeveloped or overdeveloped have great problem in adjustment. The important problems of this area are weak eyes, poor teeth, too short or too tall height, poor complexion, headaches and frequent colds.

Sex education and adolescents

Social environment has many occasions when adolescents come to know about sex and its problems. The child comes to know about sex from the early age of six. Surveys made by Ramsey and Hamilton prove that children cannot be kept ignorant of sex knowledge.

The important sources which provide sex knowledge to children include: friends, literature, old people, movies, ?drawings, reproduction in animal life, and physiological development.

These sources and a number of others are responsible for providing knowledge of sex. The knowledge which is received from these sources is injurious to mental and physical health of adolescents. Many boys and girls suffer from worries and venereal diseases because of their wrong information about sex and lack of proper guidance. All teachers, social workers and psychologists agree that sex education should be provided to children.

The provision of sex education should be made from the early life of the child. It is the responsibility of parents to inculcate good habits in their children and develop positive attitudes toward sex problems. Our social values are quite different from the Western countries where adolescents discuss sex problems with their parents.

Vocational interests

The child up to 12 years of age does not bother much about his/her future career but as he/she reaches 16 years of age he/she starts thinking about his/her future career. The choice of future career by an adolescent significantly affects his/her future social relationship in the society and indirect progress of the country.

Several factors affect the choice of future career in adolescence. The most important factors are as follows:

- **Urban-rural factor:** Adolescents who come from rural areas generally aspire for low paid and lower prestige jobs than adolescents from urban areas.

An interesting study was conducted by Sewell and Ovenstein in 1965 to study the relationship between socio-economic status and community size. They have reported in their study that adolescents coming from lower socio-economic conditions are exposed to poor stimulation in the sense that they have contact with people of low status who do not provide good models for inspiring adolescents for higher vocations. They are exposed to less number of vocations.

- **Sex differences:** Sex differences make great differences in the choice of vocation. Earlier women were thought to be fit for limited vocations; but in recent times, women have entered almost all professions with success. But

in India, parents generally do not permit their daughters to opt for certain professions such as the military.

- **Father's occupation:** Generally, adolescent boys identify themselves with the career of their fathers. Werts, 1968, who studied fathers' occupation and career choice of 76,000 boys found that the sons of physical scientists, social scientists; and medical men tended to choose the careers of their fathers.
- **Occupational attractiveness:** Adolescents are led to make their vocational choice by the prestige, income, and social recognition to the profession by the society. Socio-economic class and intellectual level and availability of vocation are important factors which affect the choice of career in adolescents.

3.6 THEORIES OF CHILD DEVELOPMENT

Child psychology has been an area of great importance and interest for the researchers since the 1950s. Researchers have devoted most of their time to explore this neglected field and developed several theories of child development. In this section, we will describe some of the major theories which explain child development from different angles.

All theories of development can be classified into three broad categories:

1. *Psychoanalytic theory* has been largely derived from the works of Sigmund Freud and Erikson. It emphasizes the importance of early childhood experiences on later development of the child and gives importance to unconscious motivation.
2. *Behaviouristic theory of child development* lays importance on learning of stimulus response associations. The associations may result from either classical or operant conditioning procedure. It attempts to be more scientific than other theories of development by concentrating only on scientifically observable and measurable behaviour.
3. *Cognitive theory of development* lays emphasis on perception and its organization. It is a molar approach to human development.

3.6.1 Psychoanalytic Theory

Here, we will briefly describe the theories of Freud and Erikson.

Freud's theory

According to Freud, a child passes through five major stages of psychosexual development. Each stage is characterized by certain behavioural changes. The stages are given as follows:

- (i) **Oral stage:** The focus of pleasure in the oral stage is mouth.
- (ii) **Anal stage:** It refers to the stages when the focus of pleasure shifts from mouth to the anus.
- (iii) **Phallic stage:** This stage refers to around the age of three to six. The focus of pleasure shifts from anus to the sexual organs.

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Check Your Progress

6. How does A.T. Jersild define adolescence?
7. What are the limitations of the Hall's theory of development?
8. How has S.R. Laycock grouped the problems of adolescents?

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(iv) **Latency stage:** During this stage, infantile sexuality becomes less important. The child engages himself/herself in learning skills and in the development of values.

(v) **Genital stage:** The focus of pleasure shifts to the member of the opposite sex.

Erikson's theory

Erikson has proposed another theory on the stages of child development. He stressed upon Epigenetic Principle, according to which new properties, which were not contained in the original situation, develop as a result of environmental influences and the interaction between the former (original situation) and the latter (environmental factors). He divides stages of development into eight phases marked by specific developmental characteristics. The stages are mentioned in Table 3.2.

Table 3.2 Eight Phase of Development

S. No.	Stage	Psychosocial crises
1.	Birth to first year	Trust vs mistrust
2.	1 to 2 years	Autonomy vs shame, doubt
3.	3 to 5 years	Initiative vs guilt
4.	6 to 12 years	Industry vs inferiority
5.	Adolescence	Identity vs Identity diffusion or Role confusion
6.	Early adult	Intimacy vs Isolation
7.	Young and middle adult	Generativity vs Stagnation
8.	Later adult	Integrity vs Despair

3.6.2 Behavioural Theory

Under behavioural theory, you will learn about the theories propounded by Robert S. Sears and Albert Bandura.

Robert S. Sears' development theory

Sears, an American child psychologist, provides a behavioural approach to the study of child development. Behavioural approach lays emphasis on learning experiences of the child which involve stimulus-response associations that may result from either classical or operant conditioning procedures. Sears' theory of child development suggests that development is a process of observable social interaction. He derived the main concepts from Hull's learning theory. Sears emphasized the importance of reinforcement and secondary drive behaviour. He divided human development into three broad phases. A brief description of the phases is given as follows:

Phase I: Rudimentary behaviour. (Innate needs and initial behaviour learning). Phase I starts from birth and continues up to 16 months. During this period, the behaviour of the infant is activated by innate needs which create tension and in order to reduce tension, the infant is motivated for action which gratify its needs. The infant's behaviour operates purely on an altruistic level unrelated to any social world, but gradually social events become the prime motivator of behaviour, for example, hunger motivates the infant for action (crying) and he requires the bottle or breast for the gratification of his need and his actions become more learned and goal-directed. He strives to imitate previously successful actions and thus socialization begins.

Phase II: Secondary behavioural systems. The training for socialization of the child begins in this phase in the family. The child is motivated by the basic requirements of life and secondary dependency needs. Parents and other members of the family continue to be the major reinforcing agents of the child's behaviour. Parents should reinforce desirable behaviour of children.

The child begins to imitate the behaviour of his/her parents. Therefore, it is very important that parents should present a role model before the child. Social learning depends upon replacing previous learning with newer experiences based upon more appropriate satisfaction rather than upon fearing and avoiding unpleasant consequences. Punishment should be avoided because it creates behaviour problems. During this phase, children begin to satisfy their dependency need themselves. They start imitating spontaneously the behaviour of parents and the other person who works as model. Dependency decreases with age and unfolds in the process of identification with peers. Formerly, the dependence was on parents, but now it extends to many persons.

Phase III: Secondary motivational system. During this phase, the social boundary of the child expands beyond the four walls of home. The child comes into contact with other families and the process of socialization is accelerated. Dependency becomes reduced to a specific sphere of family living. The teacher becomes a new support for dependence in school.

Albert Bandura's theory

Albert Bandura is a social learning theorist who is most concerned with social and moral developments. He emphasizes the importance of reward and punishment in the development of behaviour. Behaviour is learned through conditioning and observational learning. Children's responses that are reinforced are more likely to recur than responses that are not reinforced. There is positive correlation between reward or punishment and their effect on the behaviour of the child.

According to Bandura, the child's behaviour is affected by satisfaction and pleasure. In early childhood parental approval and fear or anxiety associated with punishment influence the moral and social development of the child.

3.6.3 Cognitive Theory

Under cognitive theory, we will discuss the theories propounded by Jean Piaget, Kohlberg and Havighurst.

Jean Piaget's theory of moral development

Jean Piaget is a cognitive theorist who has been working on child development for the last four decades. He has produced enormous literature on developmental psychology. According to him, there are four stages of child development.

The first stage is called the **sensorimotor period** when the infant learns and develops sensorimotor skills by manipulating objects in its environment. In the second stage, which runs from two to seven years, the child begins to acquire vocabulary with which he/she represents objects and experiences he/she perceives.

The child can extract concepts from experience and can manipulate objects in his/her mind. This stage is called **pre-operational thought**.

The third stage is called **concrete operation period** which begins from seven and continues up to twelve years of age. The child begins to think logically and rationally about problems which he/she faces.

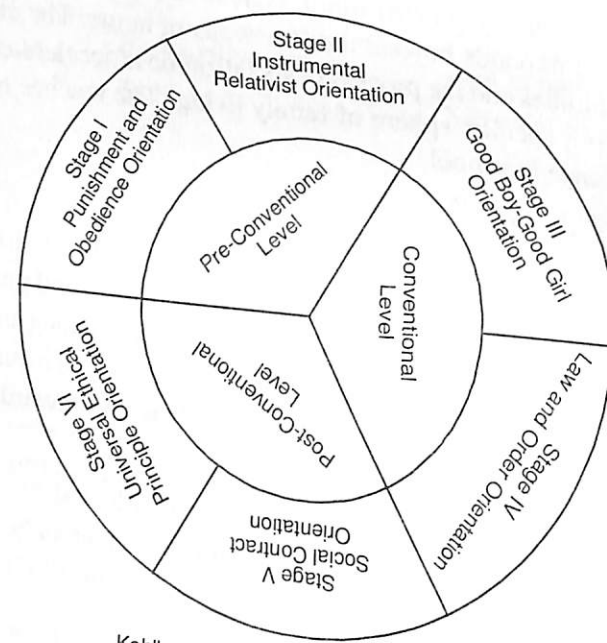
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The fourth stage is known as **formal operations period**. It begins from twelve years of age and continues till the end of adolescence. The adolescent can think, reason and analyse beyond the realm of concrete experiences. He/She can generalize or form opinion about abstract concepts like love, honour, truth and justice, etc.

Kohlberg's theory of moral development

Kohlberg's theory, like Piaget's, emphasizes that moral development proceeds in sequential stages. There are three levels of moral development: (i) pre-conventional level; (ii) conventional level; and (iii) post-conventional level. At the pre-conventional level, the child follows the rules set down by others. At the conventional level, he/she adopts rules and sometimes subordinates his/her own needs to the needs of others. At the post-conventional level, people define their own values in terms of ethical principles they have chosen. According to Kohlberg, a child passes through six distinctive stages of moral development (Figure 3.1).



Kohlberg's Stage of Moral Development

Fig. 3.1 Stages of Moral Development

Havighurst's theory of developmental tasks

Havighurst developed a specific task model of development. According to him, at each new stage of development, there are certain tasks, skills, attitudes and understanding that must be met before a person can move on to a higher level of development. He says:

'... at or about a certain period in the life of the individual, successful achievement of which leads to his happiness and to success with later tasks, while failure leads to unhappiness in the individual, disapproval by society and difficulty with later tasks.'

Table 3.3 lists the development tasks identified by Havighurst.

Table 3.3 List of Development Tasks

Birth to 6 years	6 to 12 years
1. Learning to walk.	1. Learning physical skills, ordinary games.
2. Learning to take solid food.	2. Building wholesome attitudes towards oneself as a growing organism.
3. Learning to talk.	3. Learning to get along with age-mates.
4. Learning to control the elimination of body wastes.	4. Learning an appropriate masculine or feminine role.
5. Learning sex-differences.	5. Developing fundamental skills in reading, writing and calculating.
6. Achieving physiological stability.	6. Developing concepts necessary for everyday living.
7. Forming simple concepts of social and physical reality.	7. Developing conscience, morality and values.
8. Learning to relate oneself emotionally to parents, siblings and other people.	8. Achieving personal independence.
9. Learning to distinguish right and wrong and developing a conscience.	9. Developing attitudes towards social groups and institutions.

3.7 DEVELOPMENTAL TASKS AND THEIR EDUCATIONAL IMPLICATIONS

You also need to understand the concept of development tasks in terms of adolescents.

Needs and developmental tasks of adolescents

The term 'need' occupies a central position in the educational system. Educational policy planning as regards the curriculum construction for various age levels, and formulation of the objectives of education, depends on the concept of needs. The term need has been defined in various ways. According to some psychologists, needs are theoretical explanation of observed behaviour of the organism and cannot be directly observed but are inferred from the behaviour of the individual. Tolman defines a need as 'a readiness or tendency to persist toward and perform a consumatory response'. He has classified human needs into three broad categories:

- Primary needs such as hunger, thirst and sex;
- Secondary needs such as affiliation and dominance; and
- Tertiary needs, such as wealth and academic achievement

Murray defines a need as a hypothetical construct. It is resultant of forces. One need succeeds another. Needs have been interpreted in two different ways:

- Needs are **child-centred** and must be fulfilled if the child is to develop harmoniously. When we translate this approach of needs, our education becomes child-centred.
- The society feels that deficiency of children should be corrected for the social progress. When we interpret needs in relation to the society, the whole concept changes and our education becomes **teacher-centred**.

Needs of adolescents are as follows:

- Physiological needs:** In addition to basic needs of hunger, thirst and oxygen, the need of sex is very prominent in adolescents.

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Check Your Progress

- What is the behaviouristic theory of child development?
- What is the Kohlberg's theory of moral development?

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- **Social/Status needs:** The need for status, independence, security and affection.
- **Ego/Integrative needs:** Need for satisfying philosophy of life, and need for personal achievement.

Concept of developmental task

The term 'need' has become so much confused in psychological literature that educationists and psychologists developed another concept in place of need—developmental task. The concept of developmental task was developed by Havighurst. It stands midway of child-centred and teacher-centred education. It stands between basic needs and theory of determination of needs by the society.

It is a recognized fact that in every culture of the world, it is possible to learn certain skills and behaviours at some stages which make the adjustment in society more adequate. Every culture of the world sets a number of tasks for the successful adjustment of the individual in the society.

The concept of a developmental synthesis implies an objective toward which the synthesis moves. The student has certain ends that are special for adolescents called developmental tasks. These are inescapable requirements imposed by the person himself/herself or by the society. They mean that he/she must possess or acquire an acceptable level in certain kinds of competencies according to his/her age, sex and situation. Failure to achieve competency has a crippling effect on further personality development along the dimension in question. Failure in competency achievement, characteristics of a given developmental period, are difficult to make up at a later stage.

Havighurst proposed a system of developmental tasks for American adolescents. He described in detail the developmental process and its relation to educational objectives. Developmental task has been defined by Havighurst as: 'A developmental task is a task which arises at or about a certain period in the life of the individual, successful achievement of which leads to his happiness and success with later tasks, while failure leads to unhappiness in the individual, disapproval by the society and difficulty with later tasks.'

Havighurst points out that any particular developmental task becomes appropriate for an individual when one or more of the following characteristics have developed:

- physical maturation i.e., there are certain tasks which arise physical growth of the child such as walking;
- society expects certain behaviour from the individual and the individual under cultural pressures learns these tasks as vocational preparation and preparing for family and married life; and
- personal values, aspirations, and psychological competence.

Importance of developmental tasks

The following are the advantages of developmental tasks:

- (i) The concept of developmental task is very helpful in specifying the course content and its objectives in definite terms. They serve as guidelines to the individual. He/She can know in advance what the society expects from him/her at a given age. Parents of young children can be guided in teaching their children skills and other social competencies which the society expects from them.

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- (ii) The second important purpose which the concept of the developmental task serves is to show the individual what lies ahead and what will be expected when he/she reaches the next stage of development. This develops purposefulness in the effort of the individual by providing a definite goal.
- (iii) The concept of developmental task is also very helpful to the teacher to be prepared to avail the opportunity and preparing appropriate atmosphere to achieve a developmental task. Educational efforts can be tuned with the developmental characteristics of the individuals. The educational efforts will not go waste because now they may be organized at the appropriate moment.
- (iv) The developmental tasks create purposefulness in the efforts of the individual by providing a definite goal. They give direction to the behaviour and maintain motivation of the individual for work.
- (v) Developmental task is midway between an individual's needs and demands of the society which indicates that the concept of developmental task reconciles between the needs of the individual and demands of the society. It makes the teaching-learning process more functional to face the challenges of life effectively.

Developmental tasks of adolescence

The following developmental tasks, though developed in American social set-up where the cultural and socio-economic conditions are quite different from our conditions, provide us a general pattern of developmental activities which may be adopted to the Indian changing conditions with certain modifications.

You have learned about the physical and mental characteristics of adolescents in previous section. Now we will see how these developmental characteristics can be utilized in the school programme to develop a harmonious and integrated personality in the adolescents. A few tentative suggestions are given as follows:

- Adolescence is a period when a number of physical and physiological changes occur in adolescents. Physical energy is at its climax. The new system of education has compulsorily prescribed work experience for class 1 to 10 to channelize the physical and mental energy of adolescents.
- Adolescents are anxious of their physical development. The school should arrange medical examination of all adolescents and proper arrangements of physical and health education should be made in every school.
- Adolescents coming from poor socio-economic conditions or culturally backward areas should be provided balanced diet for proper physical development. The school should make an effort to lay down the foundation of sound physical development.
- Adolescents are overwhelmed by a number of problems, particularly sex problems. It is desirable to provide sex education and moral education to adolescents to develop positive and healthy attitude towards the opposite sex.
- The most important function of school is to provide a conducive environment within the school for the proper development of their mental abilities. The school should provide good libraries, opportunities for free discussion and community service.
- Adolescents should be provided opportunities for the development of their creative abilities through music, dance, arts and crafts. Divergent thinking

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- should be encouraged. The teacher should help adolescents to develop a positive attitude towards life.
- Adolescents should be provided guidance as regards their individual educational and vocational problems.
 - Research is needed to develop a list of developmental tasks for Indian adolescents.
 - The teacher must attend to the varying shades of differences in individuals and try to help the students to develop their potentialities to the maximum for the benefit of larger society. He/She should remain constantly watchful whether he/she is using his/her knowledge of psychology in a mechanical way or judiciously, and satisfy the curiosity of individual adolescents and the class as a whole.

3.8 HEREDITY AND ENVIRONMENT AND THEIR EDUCATIONAL IMPLICATIONS

The influence of heredity and environment on the development of an individual has been viewed differently by scholars. There are extreme views also. But the fact remains that the functioning of heredity and environment is similar to that of two eyes, two hands, two feet, two legs, etc., on the development of a person. Each one is complementary and supplementary to the other. Sometimes one plays a more dominant role and the other relatively less dominant role. For the balanced and harmonious development of an individual, a balanced and harmonious interaction between heredity and environment is very essential. Of course, each has its limitations. There is a limit to which each can influence the development of the individual. The role of the home and the school is to ensure that optimum use is made of these limits.

Meaning of Heredity

In the words of R.S. Woodworth (1945): 'Heredity covers all the factors that are present in the individual when he begins life not at birth, but at the time of conception about nine months before birth.'

O.B. Douglas and B.F. Holland (1947) define heredity as: 'One's heredity consists of all the structures, physical characteristics, functions or capacities derived from parents, other ancestry or species.'

Every child comes into this world with certain physical and mental characteristics which he got from his parents and ancestors. He is born with a body and mind which developed from the fertilized ovum. His limbs and organs grow from the same. Some of his mental tendencies are also based on the same. This is all account of heredity.

It is seen that a cat gives birth to a kitten, a dog to a puppy and a human being to a human being. It is on account of this factor we say that the class of dogs will give birth to puppies or that *like begets like*. Still there we find a lot of variation among cats or dogs or human beings even if they are born of the same parents. Why does this happen! We shall make a brief study of this phenomenon.

Principles of heredity: How heredity operates

1. **Like tends to beget like:** Black-coloured parents generally have black children. tall parents have tall children, bright parents have bright children, and so on. This holds good of all other characteristics and racial differences. Nature sees

to it that each species or genus breeds true to type, save where there are laws governing occasional deviations.

2. **Principle of variance:** Only certain traits follow hereditary laws. Common observation shows that although like tends to beget like, yet the resemblances of parents and their offsprings are never perfect. Black-eyed children may be born to brown-eyed parents. Even the two twins are not exactly alike.
3. **Principle of convergence of two life streams:** A portion of inheritance comes from the maternal side and the remaining portion is contributed by the paternal side, i.e., the child's maternal and paternal lines, both contribute about 50 per cent each of his inheritance. More specifically, it is generally assumed that 1/2 comes from parents, 1/4 from his grandparents, 1/8 from his great grandparents, and so on, from all the other more remote ancestors.
4. **Principle of chance:** Chance plays an important role, making any absolute prediction almost impossible. This is on account of several reason: (i) the pairing of the chromosomes in the state of flux, (ii) cell to which the set of maternal or paternal chromosomes goes during the reduction division, (iii) the particular cell which unites with another in the maternal and paternal lines, (iv) the pattern of genes in any chromosome, (v) genes carried in any particular chromosome, (vi) crossing over of genes from one paired chromosome to another, (vii) how dominant and recessive traits will be distributed according to the three to one ratio, according to Gregor Mendel's Law (1866), especially if there are less than four children in the family, and (viii) determination of sex.
5. **Principle of dominant and recessive traits:** Some traits are dominant, while other are recessive causing apparent exceptions to the principle of *like produces like*. The union of the best traits of the father with the best traits of the mother produces talented children. Therefore, a talented father or mother must be the offspring of the best combination of the determiners in the germ cells of his or her parents. But such gifted parents may carry on the determiners of genes which are average. There are many chances that when they produce a child, their average traits combine and a child of average calibre may be the result.

The reasons of variation are still a mystery. All that can be said about variations is that it is a fact of life.

Mechanism of heredity

The origin of every human life can be traced to a single cell, known as zygote. When a sperm unites with an ovum, the combination results into a fertilized egg or zygote. The male generation cell is known as 'sperm' or 'spermatozoon', and the female cell is an egg is known as 'ovum'. The zygote is formed by two cells—the male and the female. The discharge of ovum takes place first in the fallopian tube and then in the womb. There it is fertilized by the sperm. The genes, which are the carriers of distinctive traits are always present both in the sperm and the ovum. The ovum is only 1/25 of an inch in its diameter and the sperm is about 3,00,000 times smaller than the ovum.

The sperm carries a number of bodies called chromosomes. For human beings, the number is 23 each for male and female. Consequently, when the sperm unites with egg the fertilized egg will contain twenty-three pairs of chromosomes. Each chromosome bears a large number of genes. Genes are regarded as carriers of heredity. So in one egg or zygote, there can be thousands of possible combinations. On this combination of male and female genes depends the entire heredity.

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Check Your Progress

11. What is Tolman's classification of human needs?
12. What do you understand by 'developmental task'?

Hereditary traits

Hereditary traits may be divided into two categories:

- (i) physical traits
- (ii) mental traits. Physical traits include eye-colour, white forelock of hair, colour-blindness, blood type, skin colour, height and several other bodily features. Mental traits include intelligence and musical talents, etc.

It must be remembered that each child is the inheritor in equal parts from both the parents who in turn inherit equally from their parents. The stream of life flows on and the child inherits his capital not *from his parents* but *through his parents*. This fact explains why a child has the chin of his mother, the forehead of his father, the blue colour of eyes from his grandfather, the hair from his uncle, the nose from his aunt, and so on.

What an individual gets from heredity is determined by the genes which he receives through his parents. The traits of the ancestors besides those of immediate parents are also transmitted to the offspring through these genes. Therefore, it is possible that the child may possess certain traits that are traceable to one or more of the ancestors, even though they may not be found in either of the parents.

Determination of the sex of the child

Of the 23 pairs of chromosomes, one pair is responsible for determining the sex of the child. This pair is called the sex chromosome. In the male, one member of the pair is an X chromosome, while the second member which is smaller in size, is called a Y chromosome. Females have two X chromosomes. At the time of conception, mother has no alternative but to contribute X sex chromosome, while the father may contribute X or Y chromosome. If a child receives the same chromosomes X from the parents, she will be female child; if father's contribution is in the form of Y chromosome, he will be a male child. From this we may easily conclude that it is totally incorrect to blame either of the parents for the sex of the child. If at all there is some role which may be considered dominating, it is of the father not of the mother as she is neutral in providing a X chromosome always for the conception.

Heredity: Identical and fraternal twins

Normally at the time of fertilization, a single ovum is fertilized by a sperm of the male. It results in the birth of a single offspring at one time. But sometime this normal function is disturbed and there are cases of multiple births—the birth of two or more off-springs at a time. There are two distinctly different types of twins namely Identical twins and Fraternal twins.

Identical twins: Usually the fertilization of one ovum by one sperm produces the offspring. Sometimes, however, it so happens that when the ovum splits, as a result of fertilization the two parts fail to unite together. The result is that each part develops into a complete individual. The twins formed thus are called identical because they, exactly, carry the same genes. They possess almost the same characteristics and are definitely of the same sex.

Fraternal twins. Normally in the ovary of the human female during each menstrual period only one ovum is matured, but it may happen that two or more ova may mature simultaneously and be fertilized at the same time by two different sperms. The result is that two different zygotes are produced. The individuals thus produced

are known as the fraternal twins. They have different combination of chromosomes and genes as both ova are fertilized by different sperms. Fraternal twins, therefore, are sure to differ in many traits. Like the identical twins, they need not belong to the same sex. They may belong to the same or opposite sex.

Meaning of Environment

In a broad sense, environment means cultural, economic, intellectual, moral, physical, political, religious and social factors which influence the development of the individual. All these factors influence and mould the behaviour of a person from time to time. Two individuals born with the same biological heritage differ because of differing environments. Sometimes, it is said that environment is nothing but a process under suitable conditions to change the shape of raw material just as a potter does while making toys of mud. But this analogy is not exactly applicable to a human being who is an animate one. He is not only influenced by the environment, but also influences the environment. Environment includes the home, the neighbourhood, the peers, the school and a host of other agencies. No individual is the same at maturity as he was born. The environment changed him. Everything that influences the child apart from himself what he inherits from his parents and ancestors is his environment. In this context we may note the following definitions of environment.

O.B. Douglas and B.F. Holland (1947) define environment as 'a word which describes, in the aggregate, all of the extrinsic (external) forces influences and conditions, which affect the life, nature, behaviour and the growth, development and maturation of living organisms'.

R.S. Woodworth and D.G. Marques (1948) state, 'environment covers all the outside factors that have acted on the individual since he began life'.

E.G. Boring, H.S. Longeld and HP Fed write, 'the environment is even thing that affects the individual except his genes'.

Relative importance of heredity and environment

The relative importance of heredity and environment are as follows:

- **Heredity is all in all:** According to A.E. Wiggam (quoted by G.W. Allport - 1948), "Nearly all the misery and nearly all the happiness in the world are due not to environment. The difference among men are due to differences in the germ cells with which they are born."
- **Environment is all in all:** J.B. Watson (1925) considered environment all in all in human development. He wrote: 'There is no such thing as inheritance of capacity, talent, temperament, mental constitution and characteristics. There is nothing from within to develop. You do not need anything else in the way of raw material to make a man, be that man a genius, a cultured gentleman, a rowdy or a thug.'

Many psychologists agree with the view that 'the inborn nature is the sole determining factor to the possibility to which the child can be educated'. They do not find any weightage in the influence of environment: The psychologists give all importance to nature or heredity which determines the development of the young ones.

Another school of thought believes otherwise. It gives all credit to nurture. The adherents of this school think that a child may be developed to any level according to

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the breeding. They claim to make Gandhis and Jawahars of any babies given into their charge from birth provided the children live in the selected environment for a long time.

The problem is very important for education. If heredity is everything, if we get a ready-made personality by birth and it is to develop according to its own inborn tendencies; then why to establish so many schools and other institutions for the reform and guidance of children. On the other hand, if it is all nurture that is to count, then why should we tolerate anybody less than Gandhi or Nehru in calibre. In the words of Woodworth, 'shall the gardener pin his hope on careful cultivation of the soil or on selection of the best seed?'

Relative contribution of heredity and environment in growth and development

In the words of H.J. Butchar (1968): 'It should be realized at once that hardly any observable quality, physical or mental, can be ascribed to the influence of heredity alone or environment alone. Even where a particular observable aspect of behaviour has been shown to be directly influenced by a gene or single genetic unit (such cases are rare in the study of human beings), this is no guarantee in itself that the observable is not also substantially dependent on variations in the environment. This principle is illustrated by a finding of Hogben about the fly *Drosophila*, in which he established that two distinct genetics mutations affect the number of facets in the fly's eye.'

According to T.P Nunn: 'The fundamental truth is that it (the child) is a centre of creative energy which uses endowment and environment as its medium; so that the elements it receives from nature and nurture do not themselves make it what it is, except insofar as they are the basis of the free activity which is the essential fact of its existence.'

The much-mentioned slogan 'heredity *versus* environment' is misconception. We should talk of 'heredity in the environment'. Both heredity and environment are essential for development. Hence any trait of the individual is the 'product' of heredity and environment. The individual does not equal heredity + environment but equals heredity X environment i.e., O (Organism or individual) = H (heredity) X E (Environment). Heredity sets the probable biological limit, whereas environment determines the level up to which the development is possible. Every development is due to an interaction of heredity and environment.

Personality may be compared to a rectangle. Heredity makes the base while environment the altitude. A rectangle cannot exist without either of the two.

Sometimes heredity plays a major role in the development of personality and sometimes environment. However, both play their roles. In case both the base i.e., the heredity and the altitude i.e., the environment are inferior, we shall have Jukes and Kalikaks as offsprings.

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A. In the area of physical growth and development	Heredity Height, bodily frames and structure of the bodily organs are probably determined by the growth potentials in the genes; the structure of the nervous system also is probably determined genetically. The limits of sensorimotor development are set genetically, and these limits vary widely. Thus, the great differences in the motor skills and athletic abilities of children, youth and adults are caused, largely by heredity.	Environment All hereditary influences can be distorted by abnormal environment. However, physical health and survival itself depends on good care. Good medical skills, including public health practices, and good nutrition are essential. Deficiencies and deprivation inflict huge penalties on the human body.
B. In mental growth and development	The evidence indicates that children are born with a very wide range of general mental potential and with different potentialities for music, painting, the other arts, public speaking, and so forth, for which limits are set genetically.	Good environments are needed for developing abilities to levels close to capacity levels.
C. In mental and emotional health and personality	People seem to be born with physical structures—nervous system, glands and organs on which emotional stability depends and they differ great in their potential stability as a result, that is some people are much more disposed by heredity to mental instability than others.	If children are raised in a healthful home where the blood or foster parents live in love and harmony and are kind and supportive to the children, there is a high probability that the children will have good mental and emotional health and thus good personality development. In protective environments, fewer of the unstable in the population will become mentally and emotionally ill than in severe and insulting environments.
D. In attitudes, beliefs and values	Position in life depends a great deal on capacities, which are set, to a considerable extent, by inheritance.	Attitudes, beliefs, and values develop largely from the culture into which one is born, and are influenced greatly by ego, or personal involvement.

Educational implications

The parents, the teachers and the community have to play a significant role in providing the rich environment in all its facets. As teachers we have to have a greater faith in the forces of environment though the forces of heredity cannot be totally ignored. Education can eliminate those influences and circumstances which inhibit and stunt the full growth and development of inherited traits and capacities and encourage and provide for those which favour it. Scientific educational principles require that the inherited inclinations, capacities and interests of every child should be studied early and even a facility should be provided in the environment to develop all that is best in him as an individual. Educational institutions should provide suitable opportunities for every individual to unfold his latent powers. A rich and fruitful environment must be provided to draw out the best in child and man—body, mind and soul. Individual differences of children must be found out and necessary conditions created for their optimum development.

The picture of an ideal environment of a well-managed school for the optimum development of children has been very beautifully described by S. Balakrishna Joshi

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(1955) as: 'A school is not a mere brick and mortar structure housing a miscellany of pupils and teachers; a school is not a market place where a heterogeneous crowd gathers with diverse objects; a school is not a rigorous reformatory where juvenile suspects are kept under vigilant watch, a school is a spiritual organism with distinctive personality of its own, a school is a vibrant community centre, radiating life and energy all round; a school is a wonderful edifice, resting on the foundation of goodwill—goodwill of the public, goodwill of the parents; goodwill of the pupils. In a word, a well conducted school is a happy home, a sacred shrine, a social centre, a state in miniature and bewitching Brindavan, all beautifully blended into a synthetic structure.'

ACTIVITY

Research on the Internet and mention a few studies on genetics.

DID YOU KNOW

Most people place their left thumb on top of their right, and this happens to be the dominant trait.

3.9 SUMMARY

In this unit, you have learnt that:

- Growth is so intricate and sensitive a process that there must be powerful stabilizing factors, intrinsic rather than extrinsic, which preserve the balance of the total pattern and direction of the growth trend.
- Development refers to interactions of a person and his environmental surroundings whose after-products alter existing response tendencies in such a way as to increase their strength, the degree of differentiation and the organization of personality.
- According to Piaget, there are four basic elements in development, which are as follows:
 - (i) Maturation
 - (ii) Experience
 - (iii) Social transmission
 - (iv) Equilibration.
- All individuals develop in their own way but in an orderly manner. Each child has his/her own rate of physical, mental, emotional and social development.
- The major stages of human development are: birth to 2 years: infancy; 2 years to 6 years: early childhood; 6 years to 12 years: later childhood; and 12 years to 19 years: adolescence.
- The child in early childhood develops a variety of motor skills which are repeated. Self-feeding, self-dressing, bathing, brushing the hair, playing with toys, using pencils, jumping, hopping, etc., develop at the age of 5 to 6 years.
- The intellectual development of the child is accelerated after the age of two years because now he/she begins to explore his/her social environment and acquires new experiences.

Check Your Progress

13. What are the two kinds of hereditary traits?
14. Give a reason how heredity and environment are interrelated.

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- The distinct physical changes during later childhood include: increased manual dexterity; increased strength; increased resistance to fatigue; increased accuracy and endurance in relation to games.
- The process of socialization confines to home and neighbourhood environment in early childhood; but as the child enters school, his/her social circle widens.
- The psychoanalytic theory of child development has been largely derived from the works of Sigmund Freud and Erikson. It emphasizes the importance of early childhood experiences on later development of the child and gives importance to unconscious motivation.
- Behaviouristic theory of child development lays importance on learning of stimulus-response associations.
- Cognitive theory of child development lays emphasis on perception and its organization. It is a molar approach to human development.
- Adolescence comes roughly in between the years from 12 to the early 20s. The onset of adolescence varies from culture to culture depending on the socio-economic conditions of the country. In this period, great changes occur in all developmental dimensions of the individual.
- Hollingworth who conducted surveys on the developmental characteristics of children holds the view that growth is a continuous process. Changes in adolescence do not occur all of a sudden, but in a gradual way.
- In adolescence marked physical changes take place which have significant behavioural implications.
- According to C.T. Morgan, emotions are basic, primeval forces of great power and influence designed by nature to enable the organism to cope with circumstances which demand the utmost effort for survival or success.
- G.S. Hall has called the period of adolescence as a period of strain and stress fraught with many problems, but other psychologists have laid emphasis on the cultural conditions as the causes of problems in adolescence.
- According to some psychologists, needs are theoretical explanation of observed behaviour of the organism and cannot be directly observed but are inferred from the behaviour of the individual.
- The concept of developmental task was developed by Havighurst. It stands midway of child-centred and teacher-centred education.
- It should be kept in mind that developmental tasks are not once for all business. They change with the socio-economic development of the country and can be replaced by new developmental tasks suiting the needs of the individual and society.
- For the balanced and harmonious development of an individual, a balanced and harmonious interaction between heredity and environment is very essential.
- Hereditary traits may be divided into two categories:
 - (i) physical traits
 - (ii) mental traits. Physical traits include eyecolour, white forelock of hair, colour-blind ness, blood type, skin colour, height and several other bodily features. Mental traits include intelligence and musical talents, etc.

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- Everything that influences the child apart from himself what he inherits from his parents and ancestors is his environment.
- Education can eliminate those influences and circumstances which inhibit and stunt the full growth and development of inherited traits and capacities and encourage and provide for those which favour it. Scientific educational principles require that the inherited inclinations, capacities and interests of every child should be studied early and even facility should be provided in the environment to develop all that is best in him as an individual.

3.10 KEY TERMS

- **Adolescence:** It is that span of years during which boys and girls move from childhood to adulthood—mentally, emotionally, socially and physically
- **Development:** Refers to emergence and expansion of capacities of the individual to provide greater facility in functioning, such as development of motor ability from uncertain steps to proficiency in games
- **Environment:** Cultural, economic, intellectual, moral, physical, political, religious and social factors which influence the development of the individual
- **Growth:** Process of becoming larger or longer or more numerous or more important; mostly a physical change
- **Maturation:** Progression of developmental changes toward the characteristics of adults
- **Need:** Readiness or tendency to persist toward and perform a consumatory response

3.11 ANSWERS TO 'CHECK YOUR PROGRESS'

1. Development refers to interactions of a person and his environmental surroundings whose after-products alter existing response tendencies in such a way as to increase their strength, the degree of differentiation and the organization of personality.
2. According to Piaget, there are four basic elements in development, which are as follows:
 - (i) Maturation
 - (ii) Experience
 - (iii) Social transmission
 - (iv) Equilibration.
3. The main directional trends in the development are:
 - (i) Cephalocaudal
 - (ii) Proximodigital
 - (iii) Locomotion.
4. The following are the major stages of human development:
 - Birth to 2 years: infancy
 - 2 years to 6 years: early childhood
 - 6 years to 12 years: later childhood
 - 12 years to 19 years: adolescence

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5. The distinct physical changes during later childhood are as follows:
 - Increased manual dexterity
 - Increased strength
 - Increased resistance to fatigue
 - Increased accuracy and endurance in relation to games
6. According to A.T. Jersild: 'Adolescence is that span of years during which boys and girls move from childhood to adulthood, mentally, emotionally, socially and physically.'
7. Psychologists have pointed out the following limitations of Hall's theory:
 - It does not take into consideration the social relationship among adolescents and social environment.
 - It is unaware of individual differences and consequent absence of those cases which deviate from the average group.
 - It does not use standardized tools.
 - It believes that acquired characteristics are genetically transmitted to the next generations.
8. S.R. Laycock has grouped the problems of adolescents under the following major tasks:
 - Adjustment at home, school, society, and with opposite sex;
 - Freedom from home;
 - Adjustment in suitable vocation; and
 - Development of a sound philosophy of life
9. The behaviouristic theory of moral development lays importance on learning of stimulus-response associations. It attempts to be more scientific than other theories of development by concentrating only on scientifically observable and measurable behaviour.
10. The Kohlberg theory of child development emphasizes that moral development proceeds in sequential stages. There are three levels of moral development:
 - (i) pre-conventional level
 - (ii) conventional level
 - (iii) post-conventional level.
11. Tolman has classified human needs into three broad categories; namely
 - (i) primary needs, such as hunger, thirst and sex;
 - (ii) secondary needs, such as affiliation and dominance; and
 - (iii) tertiary needs, such as wealth and academic achievement.
12. The concept of developmental task was developed by Havighurst. It stands midway of child-centred and teacher-centred education. It implies an objective toward which the synthesis moves.
13. Hereditary traits may be divided into two categories:
 - (i) physical traits
 - (ii) mental traits.
14. Heredity sets the probable biological limit, whereas environment determines the level up to which the development is possible. Every development is due to an interaction of heredity and environment. Personality may be compared to a rectangle. Heredity makes the base while environment the altitude. A rectangle cannot exist without either of the two.

3.12 QUESTIONS AND EXERCISES

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Short-Answer Questions

1. What is the difference between growth and development?
2. How can you say that development follows an orderly sequence?
3. Write a note on perceptual development in early childhood.
4. What mental changes are observed during adolescence?
5. What are the developmental tasks of adolescents?
6. What should be the attitude of the teachers to the problems of nature (heredity) versus nurture (environment)?

Long-Answer Questions

1. Discuss the various principles of growth and development.
2. Describe the physical changes observed during early childhood and late childhood.
3. What is the Freud psychoanalytic theory of development? How does this theory differ from the Erikson's theory of psychoanalytic development?
4. What is the significance of studying adolescence? What are the common misconceptions about adolescence?
5. Describe the process of emotional development during adolescence.
6. 'Development is a matter of both heredity and environment.' Elucidate this statement. State also the educational implications of this statement.
7. 'Heredity is all in all.' Explain. Do you agree with this statement? Give reasons.
8. 'Environment is all in all.' Elucidate this statement. Do you agree with it? Give arguments in support of your answer.
9. 'An interplay of heredity and environment contributes to learning.' Comment.

3.13 FURTHER READING

- Thorndike, R.L.; *Measurement and Evaluation in Psychology and Education*, Wiley Eastern Limited, New Delhi, 1970.
- Anastasi, A., and Urbina, S.; *Psychological Testing*, 7th edition, Prentice Hall of Private Limited, New Delhi, 1997.
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UNIT 4 THEORIES OF LEARNING AND MOTIVATION

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Structure

- 4.0 Introduction
- 4.1 Unit Objectives
- 4.2 Concept of Learning
 - 4.2.1 Definitions of Learning
 - 4.2.2 Characteristics of Learning
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 - 4.4.1 Kurt Lewin's Field Theory; 4.4.2 Tolman's Sign Theory
 - 4.4.3 Bruner's Concept Attainment Theory
 - 4.4.4 Hull's Reinforcement Theory; 4.4.5 Gagne's Hierarchy of Learning
- 4.5 Theories of Motivation
 - 4.5.1 Physiological Theory and Murray's Theory of Motivation
 - 4.5.2 Maslow's Theory of Self-Actualization
 - 4.5.3 Theory of Achievement Motivation; 4.5.4 Psychoanalytic Theory of Motivation
 - 4.5.5 Theory of Intrinsic Motivation; 4.5.6 S-R Theories of Motivation
- 4.6 Transfer of Learning and its Theories
 - 4.6.1 Definition of Transfer of Learning
 - 4.6.2 Types of Transfer of Learning
 - 4.6.3 Theories of Transfer of Learning
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- 4.7 Summary
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- 4.9 Answers to 'Check Your Progress'
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- 4.11 Further Reading

4.0 INTRODUCTION

Learning implies acquiring new or modifying existing knowledge, behaviour, skills, values or preferences and may involve synthesizing different types of information. Humans and animals possess the ability to learn. Human learning may occur as part of education, personal development or training. It may be goaloriented and may be aided by motivation. Progress of learning over time tends to follow learning curves. Various theories have been proposed to explain the process of learning. This unit focuses on various aspects of learning and motivation in detail.

4.1 UNIT OBJECTIVES

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

- Explain the nature and importance of learning
- Discuss Thorndike's laws of learning
- Explain various theories of learning
- Describe the processes of transfer of learning, remembering and forgetting

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- Explain the concept of motivation
- Describe theories of motivation, with special coverage on Maslow's self-actualization and achievement motivation theory
- Discuss the concept of transfer of theories and various theories related to it

4.2 CONCEPT OF LEARNING

Learning is the most common activity each one of us is involved in. At every point of time in our life, we are learning something. An individual starts learning from the very first day of his life that is just after he is born. A small child cries when he is hungry, and he is given food, now next time he associates being hungry with crying and he learns that whenever he will cry he will be given food. Similarly, a man touches a naked electric wire, he gets an electric shock, only then he immediately withdraws. The next time when he sees the naked electric wire, the man immediately withdraws from there. That means learning has taken place that electricity can be harmful under certain circumstances.

From these examples, it is clear that there is change in behaviour because of learning. Learning is certainly a universal experience. Kids learn to talk, to dress and to feed themselves. Adults must learn how to perform their jobs and how to meet the responsibilities of family life. Thus, learning means to discover or invent and to become efficient. Thus, learning is change in behaviour because of experience. Learning can be defined as 'the relatively permanent change in behaviour brought about as a result of experience or practice'. John B. Watson (1878-1958) was the first psychologist to study the process of learning, and he formed the school of thought known as behaviourism. Behaviourists identify learning as an internal event. However, it cannot be termed that learning is presented by an overt behaviour.

There are three components of behaviour: (i) conative, (ii) cognitive and (iii) affective. The conative aspect refers to act or doing part. Learning related to this part of behaviour means acquiring skills to perform tasks like cooking, playing, dancing, knitting, jumping, crawling, talking, walking, singing, etc. The cognitive domain means the meaningful aspect of behaviour. The activities which require mental thinking like reasoning, analysing, interpreting, concluding, illustrating are included in this dimension of learning. The affective domain is related to emotional or feeling part of the behaviour. Changes that are brought about by performing activities related to emotions and feelings like happiness, sadness and anger are included in this domain.

Why is learning important?

There can also be changes in behaviour because of maturation, but there is slight difference between maturation and learning. In case of human learning, they are closely related. In case of animals, the birds start to fly because of maturation.

If the change in behaviour is due to development through different stages, then the change in behaviour is because of maturation and not learning. If the change in behaviour does not improve with training or practice, then the change is because of maturation. For example, the child cannot speak until he attains a certain age (because of maturation), but the child cannot speak fluently if he does not learn to speak the language; this proves that maturity and learning are closely related.

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Learning involves new ways of doing things. It operates in the individual's attempts to overcome obstacles or to adjust to new situations. It represents a progressive change in behaviour as the individual reacts to a situation in an effort to adapt his behaviour effectively to the demands made upon him. It enables him to satisfy certain interests or to attain certain goals.

Learning is vertical when precision in performance is increased or when information is added to what has been already learned and it is horizontal when what is learned is integrated and organized as a part of a functional unit of expanding experience.

As an individual goes about his daily activities, he unconsciously acquires many changed modes of thought and behaviour that grow out of his experiences. These may exercise a powerful influence upon his conduct and his relations with people around him.

Learning, therefore, means change in response or behaviour including emotional behaviour; it means the acquisition of knowledge or motor skills.

There are various types of abstract learning. These include memorizing learning material with little or no understanding of its meaning (formulae or equations, for example), learning simple concepts like addition or subtraction, discovering and understanding relationships involving responses that are logical and psychologically sound.

4.2.1 Definitions of Learning

Woodworth (1945): 'Any activity can be called learning so far as it develops the individual (in any respect, good or bad) and makes him alter behaviour and experiences different from what that would otherwise have been.'

Hilgard (1958): 'Learning is the process by which an activity originates or is changed through reacting to an encountered situation, provided that the characteristics of the change in activity cannot be explained on the basis of native response, tendencies, maturation, or temporary states of the organism (e.g., fatigue of drugs etc.).'

Gardner Murphy (1968): 'The term learning covers every modification in behaviour to meet environment requirements.'

Henry P. Smith (1962): 'Learning is the acquisition of new behaviour or the strengthening or weakening of old behaviour as the result of experience.'

Garrett: 'Learning is that activity by virtue of which we organize our response with new habits.'

Kingsley and Garry: Learning process of learning

Learning is a process and it is not product by itself. Learning starts with a need or drive. Unless there is a need, the individual is not motivated to act.

When the needs of an individual are strong, he is compelled to act to satisfy those needs. So the process of learning starts with a need and then there is a drive to strive for its satisfaction.

The next step is formation of the aim or goal because the goal motivates to learn. Then there are obstacles in achieving the goal. These hindrances can be removed by acquiring the right skills.

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The internal attributes of the learner affect the learning process. The environment and learning situation also influence learning. If there are favourable learning conditions, the learning is highly effective, in the sense that it is retained for a longer period of time.

Thus, learning is a continuous ongoing process which changes the behaviour of a learner.

4.2.2 Characteristics of Learning

The change in the behaviour of the individual is more or less permanent change. These changes because of training or practice can be observed and therefore, the process of learning has special characteristics which are as follows:

- **Learning is a change in behaviour:** It is believed that because of learning there is a change in behaviour. The changes in behaviour should help the learner to develop because learning is always directed to achieve some aim.
- **Learning is the process involving stimulus and response:** The process of learning starts when the individual responds to the stimuli present in the environment. If the individual does not respond actively to the stimulus, learning will not take place.
- **Change in behaviour is a relatively permanent change:** The change in behaviour because of learning should neither be too permanent (e.g., because of maturation) nor too temporary (e.g., because of illness or fatigue).
- **Learning is an ongoing process:** Learning is an activity which starts from birth and continues till a man dies. Sometimes, it is believed that learning starts much early when the child is in the womb of the mother; such instances are referred to in Hindu Mythology when Abhimanyu learned the art of *chakravyueh* when he was in the womb of his mother.
- **Learning is a goal directed activity:** All learning takes place because of a goal or aim. Because of the aim, the individual starts learning to perform certain tasks. If there is no purpose or aim, the learning will be difficult.
- **Learning helps in the development and growth:** Learning helps an individual to achieve his full potential by learning the skills. The individual can learn physical, moral and social skills.
- **Learning helps in adjustment:** Learning helps an individual to adjust to his environment and self also.
- **Learning can be transferred from one situation to another:** The important characteristic of learning is that it can be transferred from one situation to another. This can have positive as well as negative effects. The learning in one situation can help in learning in another situation, but sometimes learning in one situation may cause obstacles in learning in other situation.
- **Learning is universal:** Every organism has the ability to learn irrespective of caste, colour, region, religion, culture and country. Thus, learning is a universal process, the organisms learn according to their needs.
- **Learning is not always positive:** Learning leads to development, but it is a fact that learning can be both in a positive direction and in negative direction. According to Woodworth, as a result of learning the pattern of development is

free to move in either direction positive or negative. A small child may learn to cheat, disrespect elders, which is all negative learning.

Characteristics of animal learning are as follows:

1. **Animals learn by doing and not by reasoning:** Human beings learn by observation. Animals learn by doing.
2. **New attachments and linking a particular stimulus with definite response:** The animals learn by experience and they avoid the responses that led to negative results and link a particular stimulus with a definite response so that it leads to positive results.
3. **Animal learning is characterized by trial and error learning:** Thorndike was of the view that learning occurred through trial and error.

Thorndike's Trial and Error Learning

In trial and error learning, the subject is strongly motivated to achieve the aim. The solution to reach the aim is not very clear. The animal made many responses, many of them wrong or ineffective, and eventually learned to repeat those that got desirable results, so that the process is learnt and the goal is achieved. Some examples of trial and error learning are the maze learning experiment and the puzzle box experiment.

In the maze learning experiment, a hungry rat is placed in an enclosure from which it can reach the food kept on the maze by taking a complicated path. The rat takes all possible paths by entering into blind alleys and finally by a lot of effort it reaches the food. Thus, it is clear that rat learns the fixed path by observation and paying attention, by eliminating the unsuccessful responses and learning by repeating the successful ones.

Puzzle box experiment

In this experiment, a hungry cat is placed in a cage with a fish outside. The cat tries to reach the food by pushing the mouth behind the bars but fails to reach the food. There was only one exit from the box: the cat could open the latch by manipulating it. There were a lot of random movements made by the cat. By making one of the movements the cat could manipulate the latch and was able to find the way out to food. In reaching to the solution the cat made errors. In due course of time the cat started opening the door without making any errors. This type of learning was named by Thorndike as trial and error learning.

4.2.3 Types of Learning

Learning has been classified in a number of ways in various categories. It is very difficult to dichotomize learning into clearcut categories because one category overlaps the other important categories are as following is the process by which behaviour is organized or changed through practice or training.

- **Deliberate or conscious learning:** For example, learning of a skill or subject. This is of two types:
 - (a) **Primary learning:** This includes learning of facts, principles and theories, etc., which are the main cores of lessons.
 - (b) **Associated learning:** This consists of the facts and other objective materials that are learned because they are related to the primary learning and are logically brought into the lesson.

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- **Unconscious or concomitant learning:** This includes learning of likes and dislikes, attitudes, etc. It is equally important as conscious learning.
 - (i) **Development learning:** According to the type of development, learning is classified as: academic learning, (ii) emotional learning, (iii) intellectual learning, (iv) moral learning, (v) motor learning, (vi) sensory learning, and (vii) social learning.
- **General learning:** It includes knowledge learning, skills learning and attitude formation, etc.
- **Hierarchical learning:** R.M. Gagne (1970) has classified learning into eight categories: (i) signal learning, (ii) S-R learning, (iii) chain learning, (iv) verbal associate learning, (v) discrimination, (vi) learning of concepts, (vii) learning of principles, and (viii) problem-solving.
- **Signal learning:** It is usually termed as classical conditioning which was developed by a Russian physiologist Pavlov. In classical conditioning, unconditioned stimulus (food) and conditioned stimulus (sound of the bell) are paired together and presented to a dog a number of times with the result that when conditioned stimulus CS (Sound of the bell) is presented alone, it elicits saliva from the mouth of the dog. This modification of behaviour which causes salivation to the sound of the bell, is called conditioning.
- **Operant conditioning:** Thorndike initiated the study of operant or instrumental conditioning with the puzzle box experiments on cats. B.F. Skinner conducted a series of experiments on animals and prepared ground for the use of the principles in human learning.
- **Chain learning:** Chain learning consists of motor and verbal chaining. Verbal chaining is a matter of connecting together in a sequence two or more previously learned stimulus responses (S's - R's). The first member or element of the sequence seems firmly tied with the second. Examples are boy and girl, daddy and mummy, horse and buggy, etc. Motor chaining may be illustrated with the following stimulus response connections in the process of unlocking a door:
 - o Key in hand
 - o Facing the lock
 - o Checking the side of the key to be inserted
 - o Inserting the key into the lock until the stop of the lock is reached
 - o Pushing the door to open it.

It must be remembered that for establishing a chain, the individual must be capable of performing the individual links.
- **Verbal associate learning:** The simplest type of verbal associate learning is explained as: 'A child is shown an object, say a doll. The next time he sees this particular object, he will be able to say that it is a doll.' Two chains are involved here.
 - (a) Observing response S-R connection that connects, the appearance of the object and distinguishes it from other objects.
 - (b) S-R connection that stimulates the child himself to say "doll".
- **Discrimination:** When the behaviour shows a specificity of response to one given stimulus to the exclusion of others, we may say that discrimination has

taken place from the very beginning, an infant learns to discriminate between a feeding bottle and a simple bottle, between walking and talking, etc. Gradually, the child learns to discriminate more objects and ideas.

- **Concept learning:** In concept learning, we deal with classes of objects as the stimuli. We form concepts by finding properties which a class of objects share in common. Thereafter, we learn generalizations within classes and gradually learn discrimination between classes. First, we learn about a dog, then various classes of dogs and then cats, etc.
- **Learning of principles:** Learning of principles depends on learning of concept formation and other forms of learning. Principles denote regular relationship among two or more concepts.
- **Problem-solving:** Problem-solving comes at the higher stage in the hierarchy of learning process. In fact, all the earlier steps lead to problem-solving.

4.3 PRINCIPLES OF LEARNING

Koffka suggested that the laws of perception were equally applicable to learning. A learning situation is a problem situation and the learner has to see the problem as a whole and find its solution by insight. The law of organization of perception as applicable to learning is the law of Pragnanz and four laws of organization subordinate to it—the laws of similarity, proximity, closure and good continuation.

- **The Law of Pragnanz:** The German word "*Pragnanz*" means "compact but significant". The law suggests the direction of events. Psychological organization tends to move in one general direction, always towards the state of Pragnanz, towards good gestalt. A good gestalt has the properties as regularity, simplicity, stability, etc.
So, this law speaks of the movement of our psychological organization towards the direction of stability i.e., we accept only those experiences which do not disturb our psychological organization (equilibrium). How good the Pragnanz is, is examined by the following subordinate laws:
- **The Law of Similarity:** This law says that 'other things being equal, the stimuli that are more similar to one another will have greater tendency to be grouped'. Thus, learning similar things is easier than learning dissimilar things.
- **The Law of Proximity:** According to this law, 'perceptual groups are favoured according to the nearness of the parts'. This means that we perceive all closely situated or located things as groups.
- **The Law of Closure:** This law states that 'closed areas are more stable than unclosed ones and therefore more readily form figures in perception'. It is similar to the Thorndike's law of effect. Unless the work is finished, the individual does not feel satisfied. He is under tension which is over only when the work is completed.
- **The Law of Good Continuation:** This law states that 'organization in perception which appears to go in a particular direction appears to be going infinitely in the same direction'. So there is a tendency of factors to give direction, movement and continuation to perceptual organization. Koffka believes in the

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Check Your Progress

1. What are the three components of behaviour?
2. How is learning classified under 'development learning'?
3. What is 'verbal chaining'?
4. Differentiate between horizontal and vertical learning.

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trace theory of memory. The function of learning is to strengthen those traces and create new ones. The essential features of the trace theory are as follows:

- (i) Trace is the result of past experience so that it represents past in the present.
- (ii) The present process can select, reactivate or communicate with the trace.
- (iii) There is a resulting new process of recall or recognition.

Factors upon which insight depends

Insight involves the following:

1. The learner perceives the situation as a whole.
2. The learner tries to understand the relationships between various factors involved in a situation.
3. As a result of the understanding of the relationship, the learner is helped in the sudden grasping of the solution of the problem.

On the whole, insight depends upon the following factors:

- (i) *Experience*—Past experiences assist in the insight of the problems.
- (ii) *Intelligence*—Basic intelligence of the learner is an important factor in insight learning.
- (iii) *Learning Situation*—A common observation insight occurs when there is ample scope for observation in a learning situation.
- (iv) *Initial Efforts*—Initial efforts in the form of trial and error open the way of insight learning.
- (v) *Reception and Generalization*—Learning gained in one situation helps the learner to react insightfully in other identical situations.

The distinctive criteria for insightful solutions are given by Yerks (1927) as:

- (a) Survey of the problem followed by critical solutions.
- (b) Repetition of the solution after a single critical solution.

According to Wertheimer, insight can be developed by productive thinking. Productive thinking helps in the systematic solution of the problem in line with the true structure of the situation.

4.4 THEORIES OF LEARNING

Theories of learning attempt to explain the mechanism of behaviour involved in the learning process. Experts have formulated different theories of learning with the result that it is not possible to give a theory which satisfies all interested persons. Before taking up theories of learning, we may consider the meaning of a theory. The most acceptable definition of a theory is that of Melvin H. Marx (1970). A theory is "a provisional explanatory proposition or set of propositions, concerning some natural phenomena and consisting of symbolic representation of: (1) the observed relationships among independent and dependent variables, (2) the mechanisms or structures presumed to underlie such relationships, or (3) inferred relationships and underlying mechanisms intended to account for observed data in the absence of any direct empirical manifestation of the relationships".

Check Your Progress

5. Define a 'learning situation'.
6. What does 'law of similarity' state?

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A theory provides detailed systematized information of an area of knowledge. It serves as guidelines to conduct further research in the area. The theory produces new facts or supplements the previous facts. It gives an organized explanation about a phenomenon. It provides practical wisdom. The theory provides effective guidelines.

Important characteristics of a theory are: (a) Testability of its principles (b) Predictability of the outcomes of the actions (c) Comprehensiveness, (d) Brevity, and (e) Simplicity.

A learning theory is supposed to find answers of the following:

1. Role of drill and practice in learning.
2. Utility of rewards and punishments or other incentives/motives in learning.
3. Place of insight and understanding in the process of learning.
4. Role of transfer of learning in various situations.
5. Limits of learning with regard to the capacity of an individual in various aspects—i.e., individual differences of age, intelligence and sex etc.

Learning theories may broadly be divided into two categories as noted below:

I. Stimulus Response (S-R) Theories

A. S-R Theories without Reinforcement

- (i) Pavlov's Classical Conditioning Theory of Learning
- (ii) Watson's Learning Theory
- (iii) Guthrie's Learning Theory

B. S-R Theories with Reinforcement

- (i) E.L. Thorndike's Theory
- (ii) Hull's Theory
- (iii) Skinner's Theory

II. Cognitive Field Theories

- (i) Gestalt Theory of Learning or Kohler's Insight Theory of Learning
- (ii) Lewin's Field Theory of Learning
- (iii) Tolman's Sign Theory of Learning

4.4.1 Kurt Lewin's Field Theory

Kurt Lewin (1890–1947), unlike Pavlov, Skinner and Gestaltian psychologists, conducted experiments on the study of behaviour of children. He utilized an elaborate experimental set-up with a view to control the child's total environment during the course of the investigation for getting detailed information. Lewin emphasized the study of behaviour as a function of the total physical and social situation. Lewin holds that psychological laws need not be formulated solely on the basis of statistical averages. Rather, the individual case is equally important. Even if all general psychological laws were known, we would still need to understand the specific individual and "total situation" in which he exists before we could make any prediction about his behaviour. Thus Lewin favours an *idiographic* psychology in which the focus is on the *individual*, as opposed to *nomothetic* psychology, where the emphasis is on *Statistical average*. Lewin describes his viewpoint in the following formula:

$$B = f(PE)$$

B represents behaviour

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f is a function

P is the person

E is the total environmental situation

Lewin explains the individual behaviour on the basis of life-space. An individual's life-space depends on his psychological force. It includes the person, his drives, tensions, thoughts and his environment, which consists of perceived objects and events. Lewin represents his theory through a diagram in which an individual is in the centre. He moves through his life-space which consists of the totality of facts that determine his behaviour at a given time.

A life-space contains the individual himself, the goals he is seeking (positive valence) or avoiding (negative valence), the barriers that restrict the individual's movements and the path he must follow to reach his goal. Desire creates tensions in the individual and tensions come to a balancing state and the person acts. After the goal has been achieved, the organism (individual) returns to a state of repose until a new desire activates him.

In Lewin's theory, threat, goal and barrier are the main factors. An individual who has to achieve some goal has to cross a barrier. The barrier may be psychological or physical. Because of the changes in the barrier in the life-space of an individual, continuous reconstruction takes place.

Lewin's theory is called field theory as to a psychologist *field* means the total psychological world in which a person lives at a certain time. It includes matters and events of past, present and future, concrete and abstract, actual and imaginary—all interpreted as simultaneous aspects of a situation. Lewin states that each person exists within a field of forces. The field of forces to which the individual is responding or reacting is called his *life-space*.

Lewin's theory regards learning as a relativistic process by which a learner develops new insight or changes old ones. According to the theory, learning is not a mechanistic process of connecting stimuli and responses within a biological organism. Field psychology explains development of insight as a change in cognitive structure of life-space.

Lewin's theory may be explained as under: Suppose a person P is moving towards a goal of getting social recognition. But to achieve the goal, he has to apologize. Now asking for apology is the barrier coming in his way. The barrier may be physical or psychological forces preventing him from reaching the goal. These forces organize themselves into a pattern which determines his future behaviour.

Lewin has classified learning into the following categories:

- (i) Learning is a change in cognitive structure.
- (ii) Learning is a change in motivation, i.e. in valences and values.
- (iii) Learning is acquisition of skills.
- (iv) Learning is a change in group belonging.

Learning of all types involves change in perception.

Changes in cognitive structure are caused by the forces in the psychological field—needs, aspirations and valences. Lewin thinks that level of aspiration depends upon the potentialities of an individual and on the influences of the group to which he belongs. Too higher or too level of aspiration discourages learning.

Lewin's system leans heavily on concepts derived from *topology*, a branch of higher mathematics that deals with transformation in space, from *vector analysis*, or the mathematics of directed lines and from the sciences of chemistry and physics concepts as *valence*, *equilibrium* and *field force*. Lewin's most important publication is *Principles of Topological Psychology* (1936).

The main concepts used in Lewin's field theory are as follows:

1. **Topology:** It is also called topological. Two basic concepts which topological space denotes are: (i) connectedness, and (ii) part-whole relationships. Topological concepts are used to represent the structure of life-space in such a way as to define the range of possible perceptions and actions. This is accomplished by showing the arrangements of the functional parts of life-space. The parts are shown as various regions and their boundaries. When an individual structures his life-space, he divides it into regions.
2. **Vector:** The term "vector" represents a force which is influencing movement towards a goal or away from it. If there is only one vector (force), there is movement in the direction of the vector. However, if there are two or more vectors acting simultaneously in different directions, the movement is in the direction of the resultant force.
3. **Life-Space:** It is also called the psychological field. The psychological field is the space in which the person moves psychologically. It contains the whole of one's psychological reality—one's self and what one thinks of or what one gains from one's physical and social environment.
4. **Person in Life-Space:** The person is often represented as a point moving about in his life-space, affected by pulls and pushes upon him, circumventing barriers in his locomotion in his own life-space.
5. **Valence:** When a person is attracted by an object, that object is said to have a positive valence. When a person is repelled by an object that is said to have a negative valence. The person tends to move towards a region in life-space that has positive valence and he tends to move away from a region in life-space that has negative valence. Because life-space may contain regions with several valences active at a time, these give rise to conflict, especially when the opposing valences are approximately in balance. Lewin specifies three chief kinds of conflict:
 - (i) *Two Positive Valence:* Such as when a child has to choose between going to picnic and playing with his friends.
 - (ii) *A Simultaneous Positive and Negative Valence:* Such as when a child is offered for a reward for the school task he does not wish to perform.
 - (iii) *Two Negative Valence:* Such as when a child is threatened with punishment if he does not do a task which he does not wish to perform.
6. **Distance and Direction:** When there is a close correspondence between life-space and physical space, physical distances and directions may be used for experimental purposes as approximations of distances and directions in life-space.
7. **Behaviour:** Lewin regards behaviour as a function of present life-space. He insists that behaviour depends upon the present and not upon the past or future.
8. **Barrier:** It is a dynamic part of an environment which resists motion through it. It stands in the way of a person's reaching his goal.

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9. **Goal:** Goal is a region of valence-region of life-space to which a person is psychologically attracted.
10. **Tension:** It is very closely to and is descriptive of psychological needs. Release of tension may be achieved either through reaching a goal or through reconstructing a life-space.
11. **Cognitive Structure:** It is an environ mean including a person as known by the person. It is synonymous with insight or understanding.

Classroom implications of field theory

Taking into consideration, the field theory as a whole, the classroom teaching-learning implications include the significance of seeing the total situation at the beginning of the lesson or an activity. The teacher should preview the activities involved and the problem to be encountered. Moreover, from the point of view of a field theorist, the teacher should keep in mind that the student, the teacher himself, other teachers, the school and the peer group—are all parts of the total situation.

The need for seeing the whole and details of the situation is very necessary. The teacher must assist the students to perceive the goal and the barrier. The goal must be presented in an easier and simplified way. Sometimes, partial insight of a situation may provide partial relief from tension.

Following are the major educational implications of this theory:

1. **Reward and Punishment:** According to Lewin, the learner because of attraction to rewards may resort to shortest methods. For example, to get distinction in the examination (record) the student may like to cheat (short-cut method). It is, therefore, necessary to put some barriers over the reward situation, to avoid access to such short methods. In the case of punishment, however, there is a tendency to leave the field because of the unpleasantness of the task unless some strong barriers are there to keep one in the field. Reward activities often become interesting and are liked so that motivation is no longer extrinsic, while the activities controlled by the threat of punishment tend to become extremely hated.
2. **Success and Failure:** Psychological analysis of success from the point of view of the learner shows the following possibilities to:
 - Reach a goal constitutes success,
 - Get within the region of the goal may be a success experience,
 - Make some progress in the direction of the goal also constitutes a success experience, and
 - Select a socially approved goal is also a success experience.

Psychological success or failure depends upon ego involvement and the level of aspiration. Success in easy task is not a success experience, since it does not involve the ego of the person. Similarly, failure in a very difficult task is no failure experience.
3. **Motivation:** The repetition of an activity brings change both in the cognitive structure and in the need-tension systems. As a result of this, goal attractiveness changes. Lewin calls goal attractiveness valence and valence change. The valence may change in any of the following ways:

- (1) Attractive goals may lose attention if the activity related to them is repeated to the points of satiation.
- (2) Choice of goals is influenced by previous experiences of success and failure.

The field theory states the following regarding memory:

- (1) Tasks which have no sense in completion are not remembered.
- (2) Unfinished tasks are remembered better than finished tasks because of psychological tension.
- (3) Tasks which lead to the satisfaction of man's needs are remembered better than tasks which lead to the satisfaction of one need.

4.4.2 Tolman's Sign Theory

Edward C Tolman (1886–1959), like behaviourists rejected the idea of introspection as a method of studying human behaviour. On the contrary, he believed the objective method of collecting data. He remarked that we do not only respond to the stimulus but we act on beliefs, and express attitudes. Behaviour can be modified by experience and training.

Tolman's theory combines the advantages of stimulus-response theories and cognitive field theories.

Tolman published his major work entitled *Purposive Behaviour in Animals and Men* (1932), and recorded the results of his experiments. He revised his theory in 1949, According to the findings of these experiments, the learner does not reach the goal in a fixed sequence of movements but changes his behaviour according to the variation in conditions.

Tolman's theory of learning is known by several names such as "sign significance theory", "expectancy theory", "purposive behaviourism" or simple "sign theory". The main features of this theory are as follows:

1. It accepts behaviourism as basis. Main characteristics of behaviour are as follows:
 - (a) Behaviour is goal-directed i.e., it is purposive.
 - (b) Behaviour makes use of environmental factors as means for getting at the goal.
 - (c) Behaviour consists of the formation of cognitive maps.
 - (d) The organism has a selective preference for the "principle of least effort", for arriving at the goal.
 - (e) Molar behaviour is docile.
2. According to Tolman, the behaviour depends upon:
 - (a) The need system
 - (b) The belief value matrix
 - (c) The behaviour space
3. This theory takes into consideration that learning is based upon some signs or clues leading to the goal. The organism learns not the movement patterns, but the sign-significative relations.

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Educational Implications of Tolman's Sign Theory

Some of the typical learning problems are as follows:

- **Capacity**—The learning of a task depends upon the capacity of the learner.
- **Practice**—Tolman believes that practice or exercise cannot help the learner in the initial selection of a right response. Mere frequency without belongingness does not establish a connection.
- **Motivation**—Motivation does not help in learning something new; it simply encourages the performance as such.
- **Understanding**—Tolman believes in learning by creative inference, inventive ideation, and so on. Insightful learning is emphasized.
- **Transfer**—Transfer of training depends upon applicability of the essential relationship perceived by the learner in one situation to some other situation.
- **Forgetting**—Repression and ratio-active inhibition cause forgetting Tolman attributes forgetting to the resistance of cathexis (relationship between a drive and object) also.

Laws of learning

Tolman stated the following laws of learning:

1. **Law of Capacity:** This relates to traits, characteristics and aptitudes of the learner which determine type of tasks and situations which can be mastered successfully.
2. **Law of Stimulus:** It deals with conditions inherent in the material itself such as belongingness of its parts and how successfully it leads to insightful solution.
3. **Law of Manner:** It is concerned with the manner of presentation of material such as frequency of presentation, distribution of practice and use of rewards.

4.4.3 Bruner's Concept Attainment Theory

J.S. Bruner has suggested a model on concept attainment and structure in teaching. He proposed that economy in thinking and responding requires that we categorize phenomena according to their common attributes. An attribute is a property or characteristic of an object which differentiates it from the other. Colour, texture, form, size, number of parts, position and sound are examples of attributes. We categorize objects having common characteristics into one group. For example, we categorize certain animals having four legs, a tail and a barking voice as dogs. Similarly, we can also categorize more abstract concepts such as enemy or friend, artisan or professional, etc. For teaching about a concept, the teacher must identify such attributes of that concept which differentiate it from others. For example, dog and cat have four legs and a tail, but cat's voice is different from a dog's voice.

Bruner studied the strategies people use in acquiring concepts. For this, he used a set of cards, some cards having borders, others without. All the cards have centre figures varying in shape (square, circle or cross), in colour (red, green or black) and in number (single, double or triple). Each card thus combines four attributes: (i) figure shape, (ii) figure number, (iii) figure colour and (iv) presence or absence of borders.

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Each attribute has three values (variations) as listed above. The subject is told that the experimenter has a concept in mind, say red circles, and the subject was to identify that concept. The subject is asked to select a card and then told by the experimenter whether or not the card was an instance of the concept. With these data in mind, the subject would select another card to determine further the attributes of the concepts and would continue doing so till he finds the answer i.e., the card with red circles.

Bruner identified four strategies in concept attainment:

- (1) simultaneous scanning strategy
- (2) successive scanning strategy
- (3) conservative focusing strategy
- (4) focus gambling strategy

1. **Simultaneous Scanning:** In this type of strategy, the subject uses each positive instance (each correctly identified card), to deduce which combinations of attribute values are no longer valid. The subject must keep in mind simultaneously all the rejected combinations in order to narrow down the range of subsequent alternatives. This technique is not very efficient since it places a great deal of strain on the subject's memory.
2. **Successive Scanning:** In this technique, the subject makes an over-all estimate of each correct characteristic of the concept and test, each one by one. This is called "successive scanning" since the subject tests individual hypothesis about the correct characteristic one at a time in succession. The technique is also inefficient as the subject may choose redundant cards which give no new information.
3. **Conservative Focusing:** In this technique, each attribute is tested by selecting a card that is different from a focus card in only one attribute. If the new card is still a positive instance, then the subject knows that the varied attribute is not part of the concept. If, however, the changed attribute yields a negative instance, then the attribute is a part of the concept. For example, the concept to be attained is "red circles". Assume that the subject encounters a positive card with three red circles and two borders. This card becomes the focus card and each variable is examined by selecting additional cards. The selection sequence is given below. A plus sign in the parentheses means the card is a positive instance of the concept, a minus sign in parentheses means that the card is a negative instance.
Four cards: 3 red circles, 2 borders (+) 2 red circles, 2 border + first decision, eliminate "three figures" as a relevant variable.
3 green circles, 2 borders (–) second decision: retain red as relevant attribute value.
3 red crosses, 2 borders (–) third decision: retain circle as relevant attribute value.
3 red circles, 1 border (+) fourth decision: eliminate "two borders" as relevant attribute value.
Conclusion: The concept is "red circle".
This technique is more efficient since the subject uses a correct instance as a point of reference and selects additional cards to test each attribute value individually.

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4. **Focus Gambling:** In this strategy, the subject focuses on a correct card, but varies more than one attribute at a time. This technique can give early results if cards chosen yield a positive instance. If, however, the subject encounters a negative instance, he cannot tell which attribute was essential. In that case, he has to revert to simultaneous-scanning technique to test hypotheses. This strategy is called gambling since the subject takes a chance varying two attributes at a time.

Bruner's strategies of concepts learning can be applied in science teaching. The use of discovery and enquiry techniques in teaching science provides the pupils with experiences quite similar to the card tasks used by Bruner. For example, if we want the pupils to invent their own system of classification of plants and animals, they can do it by identifying the attribute and putting the plants or animals with common attributes in one group.

Attributes/Characteristics of Concepts

1. **Difference in Learnability:** Some concepts are easily learned than others by children who even have similar cultural experiences and language.
2. **Usability:** In our daily life, we use some concepts more frequently than others.
3. **Validity:** Concepts in physical sciences are well defined than concepts in social sciences.
4. **Power:** There are some fundamental concepts in various disciplines which are necessary to learn in the beginning to understand other concepts. Thus, the attribute of power of a concept implies the extent which to a particular concept is essential to the attainment of other concepts.
5. **Types of Concepts:** Concepts are of numerous kinds. Relational concepts are smaller or bigger, shorter or taller, etc. Abstract concepts are such as gentleness, honesty, kindness and love, etc.
6. **Instances of Perceptibility:** A plant has many instances which can be sensed. As a plant can be seen and smelled whereas eternity has no perceptible instance. Certain concepts may have imaginary rather than actual instances.

Principles of Concept Formation

H.J. Klausmeier and Richard E. Ripple in their book, *Learning and Abilities* (1971), describe the following principles of concept formation:

1. Principle of likeness and differences among things
2. Principle of cognizance of attributes
3. Principle of correct terminology
4. Principle of proper sequence of instances
5. Principle of analysis of concepts
6. Principle of generalization of concepts
7. Principle of self discovery of concepts
8. Principle of use of concepts
9. Principle of independent evaluation

Essential Elements of Concept Learning

Concepts should be explained through as many examples as possible. Concepts should be taught through the process of connecting subject-matter; process of abstraction comes at a later stage. An analysis of a concept reduces its complexity. Positive examples are more useful. Repetition is very important at various stages.

Simple Activities Related to Concept Formation

Concept	Activity/Experience
1. Formation of number concept	1. Number rhymes 2. Number games 3. Number puzzles
2. Formation of time concept	1. Time perception cards 2. Improvised clock.
3. Formation of colour concept	1. Rhymes and songs 2. Dramatization 3. Experiences with objects, cards and clothes.
4. Formation of concept of temperature	1. Activities with an improvised thermometer 2. Simple experiments.
5. Formation of concept of physical environment	1. Sand and water play 2. Simple experiments with air/water, etc.
6. Formation of concept of social environment	Celebration of festivals.

Learning of correct concepts

From the very beginning, our efforts should be to teach concepts appropriately. It should be kept in view that faulty teaching leads to the formation of faulty concepts. Verbal explanation must be supplemented by teaching aids. In verbal talks, sufficient number of examples should be given.

There are several ways to teach concepts as follows:

- **Direct method:** One of the best ways of helping children acquire the concept of an object is to let them have direct experience. For example, if they have to learn about flowers let them see different kinds of flowers.
- **Teaching aids:** Direct experiences are not always possible. It may not be feasible to bring the lion into the classroom. Nor it is always possible to take the children to a zoo. There are several objects which are not found in children's environment. Teaching aids are helpful in teaching such concepts. Through teaching aids, like pictures and models, children can be given an idea of these objects.
- **Association:** New concepts are easily understood if they are associated with the old ones. Children should be provided with numerous instances of the concept and helped to verbalize the concept in the form of definition.

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- **Self discovery:** Children should be encouraged to differentiate old concepts and new concepts and to form their own concepts.

4.4.4 Hull's Reinforcement Theory

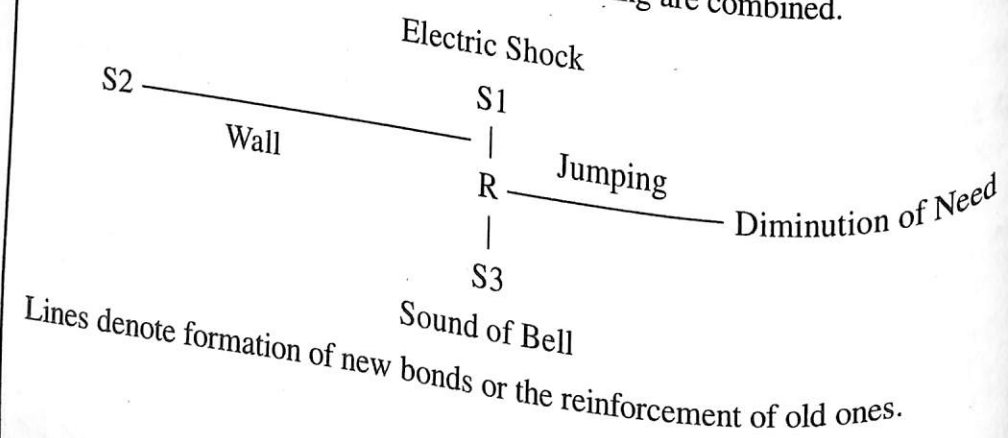
Clark L. Hull (1884–1952), professor of psychology at Yale University, related learning to the needs of the organism. His theory holds that association between S–R is not enough for learning. According to his views, some kind of reward or other reinforcement was necessary to establish the stimulus as signal. Hull emphasized the importance of the satisfaction of the needs of the children. These needs could be reduced or satisfied through some reinforcement. Hull's theory, therefore, is known as *need reduction* or reinforcement theory of learning. Needs create behaviour and the particular behaviour that reduces need is learnt by the organism.

Men and animals are always confronted with such situations in which there is need: (i) to reinforce S–R bonds which have already been formed, (ii) to form entirely new S–R bonds. A conditioned response occurs when a child feels a need. For instance, when he is hungry or thirsty, there is response and the need or drive is minimized or satisfied. In a simple way, it can be stated in these words: 'Whenever a response (R) follows quickly upon a stimulus (S), and this conjunction of S and R is closely associated in time with the diminution of a need, there will be increased tendency of that S–R to recur on later occasions.'

Hull conducted experiments to frame his theory of learning. In a puzzle box, he placed a rat in one apartment. In the box, there was another apartment which was divided by a wall. The way to the department was through a hole at the top of the dividing wall. An electric current was switched on in the compartment where there was the rat. The current was also directed into the dividing wall. To the stimulus of the electric current, the rat responded in a number of ways. It started cutting bars of the box and began to jump in a haphazard manner. In the end, it jumped into the other apartment through the hole. This was repeated till the rat learnt to jump immediately to the other apartment through the hole.

This showed that learning took place on account of the law of effect.

In the next experiment, two seconds before the electric current was switched on, a bell was rung. The rat quickly learned to jump on hearing the bell. It started jumping even earlier than the switching of the electric current, only on hearing the bell. This type of learning occurs due to conditioning. It, therefore, follows that in Hull's theory, law of effect and law of conditioning are combined.



Important Definitions Related to Hull's Theory

Important definitions related to Hull's Theory are as follows:

- **Need:** Need implies a state of the organism in which a deviation of the organism which is necessary for survival from the optimum of biological conditions, takes place. When a need arises, the organism acts with a view to reduce the need. Hence, sometimes Hull's theory of learning is called need reduction theory.
- **Drive:** Drive is a general condition or a common denominator for all primary motivation whether on account of food, water, sex or any other reason. It is a state of tension resulting from needs.
- **Reinforcement:** According to Hull, reinforcement is as 'whenever a reaction (R) takes place in temporal contiguity with an afferent receptor impulse (S) resulting from the impact upon, a receptor or stimulus (S) and this conjunction is followed closely by the diminution in a need, in the tendency of that stimulus on subsequent occasion to evoke that reaction'.
- **Postulates:** Hull stated his theory in the form of 16 postulates or general rules. Some of the postulates are given here:
 1. *Postulate of hereditary responses:* Hereditary matters in learning. These are unlearned stimulus responses.
 2. *Postulate of primary and secondary enforcement.*
 3. *Postulate of habit formation.*
 4. *Postulate of reaction potential:* It is the strength of the tendency to respond.
 5. *Postulate of stimulus intensity:* The greater the intensity of the stimulus, the greater the reaction potential for a level of habit strength.
 6. *Postulate of intensive motivation:* The greater the magnitude of the incentive used in reinforcement, the greater the reaction potential.
 7. *Postulate of stimulus generalization:* This postulate means that there are two or more alike stimuli, they can evoke exactly the same response from the organism as was evoked by the original stimulus.

Educational Implications of Hull's Theory of Learning

Curriculum should be student-need-based. Individual differences of students should be taken care of. A reasonable anxiety should be created in students. Students with mild anxiety are easier to teach. Drive in them creates restlessness and in order to release tension a series of actions would be needed. Too much or too little of anxiety is very harmful to learning.

In the course of action, the students encounter several stimuli. They make a continuous series of responses. When these stimuli occur with a response, there is a chance for an association and the association takes place only if it is followed by reward or punishment. Rewards and punishment both reduce tension of the students.

The basic educational implications of Hull's Theory of Learning are as follows:

- Hull's theory makes drive a major factor in learning. Therefore, all learning should be as stimulating as possible. Students must be motivated as much as possible.
- Hull's theory points out the importance of adequate drill and practice in learning.

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- Hull's theory emphasizes the gradual development of 'artificial incentives' in all learning situations, especially in the case of younger children, artificial incentives work wonders.

4.4.5 Gagne's Hierarchy of Learning

Gagne, in his theoretical framework, accounts for many factors of learning. However, he mainly focuses on intellectual skills. Many scholars have found his theory of prescriptive nature.

Gagne makes a distinction between the types of conditions. He saw states as the internal conditions, which included attention, motivation and recall. On the other hand, the external conditions were the factors surrounding one's behaviour, which included the arrangement and timing of stimulus events. Hence, he identified the following phases of learning:

- Phase I: Receiving the stimulus situation
- Phase II: Stage of acquisition
- Phase III: Storage
- Phase IV: Retrieval

Gagne identified the following five major types of learning levels in his theory:

1. Verbal information
2. Intellectual skills
3. Cognitive strategies
4. Motor skills
5. Attitudes

The afore-mentioned classification is necessary because each learning level requires different internal and external conditions. In other words, each learning level requires different types of instruction. For example, in order to learn cognitive strategies, there must be a chance to practice developing new solutions to problems. In order to learn attitudes, the learner must be exposed to a credible role model or persuasive arguments.

Gagne further argues that learning tasks for intellectual skills can be organized in a hierarchy according to the increasing level of complexity: stimulus recognition; response generation; procedure following; use of terminology; discriminations; concept formation; rule application; and problem solving.

This hierarchy fundamentally provides direction for instructors so that they can identify prerequisites that should be completed to facilitate learning at each level. This learning hierarchy offers a basis for forming the sequence of instruction. Gagne laid down the following nine instructional events and corresponding cognitive processes:

1. Gaining attention (reception)
2. Informing learners of the objective (expectancy)
3. Stimulating recall of prior learning (retrieval)
4. Presenting the stimulus (selective perception)
5. Providing learning guidance (semantic encoding)

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6. Eliciting performance (responding)
7. Providing feedback (reinforcement)
8. Assessing performance (retrieval)
9. Enhancing retention and transfer (generalization)

4.5 THEORIES OF MOTIVATION

A teacher is daily faced with a variety of problems in his teaching-learning situations such as Mohan is naughty in the class. He does not take interest in his studies. Ashok, another boy, engages in the anti-social activities in the school and outside the school. Maneesh Kumar, a third boy, concentrates in his studies and secures high grades in the examination. These questions and many others of similar type create anxiety and curiosity in the mind of the teacher to understand the underlying factors, which explain such type of behaviour in the students. For answers to all these questions, the teacher turns to psychology of motivation for guidance.

Tremendous research has been done on psychology of motivation in the last few decades and a number of new theories have been evolved to explain human behaviour. K.B. Madson in his book *Theory of Motivation* has given 24 theories of motivation, which propose different explanations of human behaviour.

Historically, the word 'motivation' comes from the Latin root 'moveers' which means to move. Thus, we can say that in its literal meaning motivation is the process of arousing movement in the organism. The movement is produced and regulated through the release of energy within the tissues.

1. H.W. Bernard held 'motivation refers to all those phenomena, which are involved in the stimulation of action towards particular objectives where previously there was little or no movement towards those goals'.
2. Atkinson defined motivation as, 'the term motivation refers to the arousal of tendency to act to produce one or more effects'.
3. Maslow has advanced the theory of hierarchy of needs ranging from basic physiological needs to self-actualization. According to him, 'motivation is constant, never-ending, fluctuating and complex, and that it is an almost universal characteristic of particularly every organismic state of affairs'.
4. D.O. Hebb remarked, 'the term motivation refers to the existence of an organized phase sequence, to its direction and content, to its persistence in given direction or stability of content'.

Functions of motivation

Psychologists have analysed the motivated behaviour of an organism and observed the following functions of such type of behaviour:

- **Motives energize and sustain behaviour:** Motives energize the behaviour of the organism and arouse him for action. The energy can be physiological as in drives or reintegrative resonator activity aroused by similarity between present action and residues of past ones that were emotionally significant for the person. The energy is supplied in proportion to the amount of energy output for a task. Motives not only energize the behaviour but they also sustain our interest and

Check Your Progress

7. What are the four strategies identified by Bruner in concept attainment?
8. What do you understand by 'focus gambling' strategy?
9. In Hull's Reinforcement Theory, what does 'need' signify?
10. What were the five major types of learning levels in Gagne's Hierarchy of Learning?

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behaviour for a longer period in the activity. According to Hebb, efficiency and adequacy are increased in motivated state of behaviour.

- **Motives direct and regulate human behaviour:** Motivated state is often described as guided, directed and goal-oriented. The motivated behaviour moves in a specific direction. The behaviour of the organism is purposeful and persistent. The direction of motivational behaviour is, no doubt, very complex because of the structure of the situation and the action sequences, which determine the behaviour.
- **Behaviour is selective:** Under motivated condition, the behaviour of the organism does not move in a haphazard way. It is directed toward a selective goal, which the individual sets for himself. For example, the student who is motivated to secure high grades in the examination, concentrates on his studies by selecting the appropriate means to reach his goal. The motive is terminated by the achievement of the goal.

Classification of motives

In recent years, psychologists being dissatisfied with the concept of drives as an explanation of human behaviour and the concept of goal-directed behaviour as the separate explanation, introduced the concept of motive, which incorporates the meanings of both drive and goal-directed behaviour. Motives have been used in a different sense. The *Oxford Dictionary* defines a motive as 'that which moves or induces a person to act in a certain way; a desire, fear, or other emotion or a consideration of a reason, which influences or tends to influence a person's volition; also often applied to a contemplated result or object, the desire of which tends to influence volition.' In our daily life, we use the term motive as our determination to act in some specific way, to carry out an intention, to arrive at a goal.

Suppose 'A' says that he has a motive to get high grade in the examination; this conveys A's determination to reach the goal he has set for himself, for which he will plan and follow specific strategy to accomplish it. According to Newcomb, motive like non-technical terms 'want and desire' is a word which points both inward and outward conditions such as dissatisfaction (tension and disequilibrium) and to something in the environment, which serves to remove the dissatisfaction. He says that an organism is motivated when and only it is characterized both by a state of drive and by a direction of behaviour towards some goal, which is selected in preference to all other possible goals. Motive is a concept that joins together drive and goal. Motives can be grouped in the following categories:

- **Physiological motives:** In this category, we can put those motives, which are essential for the survival of the organism. They include food, oxygen water, sex, elimination, warmth in the body and emotions.
- **Social motives:** Man is a social animal. He lives in groups, which shape his behaviour according to a definite pattern. Social motives are learned in the social environment. They are influenced by cultural heritage and philosophy of life of the people. They are rooted in physiological motives and emerge out of them gradually with advancing age of the child. Social motives are the sources which bind human beings and social progress depends on their proper development.

Some of the important social motives are social approval, affection, respect, prestige and money, etc.

- **Personal motives:** In addition to the social motives that are necessary for socialization, every person has special categories of motives that are dependent on the unique structure of the personality of the person. There may be a long list of personal motives depending upon the individual differences which motivate individuals for action. Some of the common personal motives include interests, attitudes, values, goals and self-concept.

Another classification of motives may be made as conscious and unconscious. Conscious motives may be inferred from one's behaviour but unconscious motives influence our behaviour unconsciously and we are not aware of them.

Characteristics of a Motivated Learner

Most of the successful learners understand new languages very easily; they display a lot of characteristics, most of them are clearly associated with motivation. Some of them are: positive task orientation; ego involvement; need for achievement; high aspirations; goal orientation; perseverance; and tolerance of ambiguity.

Characteristics of intrinsically-motivated learners

Intrinsic motivation comes if the activity is done by the person himself, and the activity has a meaning in itself or is valued for itself.

Following are the characteristics of intrinsically motivated learners:

- They have a positive attitude.
- They know how much they are paying attention to the topic and they control it.
- They know that they can be motivated by observing others.
- They are open-minded and they believe that the learning may be worthwhile.
- They are excited by the prospect of competence.

Characteristics of extrinsically-motivated learners

Extrinsic motivators consist of pay, benefits, status, bonuses, commissions, pension plans, expense budgets, and the like. When the extrinsic motivators are used they need to be communicated in clear ways along with their advantages and disadvantages. Of course, these consequences must be real, and not just a matter of company propaganda. Hypocrisy can be easily detected and nothing turns motivation off more effectively than the realization that one has been had.

So far we have been dealing with the concept of motivation in general; now we will examine some of the specific theories of motivation and their principal views on the explanation of behaviour.

4.5.1 Physiological Theory and Murray's Theory of Motivation

This theory was developed by Morgan and is popularly known as central motive state (CMS). He held the view that there is a central motive state, which is the basis of all the activities and its behaviour can be explained in terms of CMS. Morgan conducted several experiments and gathered evidences in support of his theory of central motive state. He mentioned the following characteristic features of the theory:

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- (i) **Persistent:** A central motive state when once aroused remains persistent and does not require support of any stimuli, internal or external.
- (ii) **General activity:** The motivated organism has heightened bodily activity.
- (iii) **Selectivity:** A central motive state results in selectivity of reaction to stimuli. The reaction does not depend upon any of the external environmental stimuli.
- (iv) **Emission of certain behaviour pattern:** The most significant feature of central motive state is that it primes or prompts the organism for appropriate consummatory behaviour.

Murray's Theory of Motivation

Murray's theory of motivation comes under need theory. His theory of motivation has been influenced by dynamic approach of psychoanalysts and field theorists. He developed a detailed system of human behaviour on the basis of his extensive work on human psychology. He put forward the concept of need to explain human behaviour. A need is a construct (hypothetical force), which stands for a force (the physical or chemical nature of which is unknown) in the brain region, a force which organizes perception, apperception, intellection, conation and action in such a way as to transform in a certain direction an existing, unsatisfying situation.

According to him, an unsatisfied need would arouse the person to work. It would be sustained until satisfaction had been attained. Each need is accompanied by a particular feeling or emotion and tends to use certain modes to further its trends. It may be weak or intense, momentary or enduring, but usually it persists and gives rise to a certain course of overt behaviour or fantasy, which changes the initiating circumstances in such a way as to bring about an end situation, which still appeases or satisfies the organism. He classified all needs into two broad categories, which are as follows:

- **Vicerogenic needs:** These needs are called primary needs, which are essential for the survival of the organism. They include water, food, oxygen, sex secretion, defaecation, urination, warmth, etc.
- **Psychogenic needs:** These needs are secondary, which emerge out of primary needs. Murray has given a long list of psychogenic needs. Some of the secondary needs are:

4.5.2 Maslow's Theory of Self-Actualization

The theory of self-actualization was developed by Abraham Maslow (1908–1970), a professor of psychology. He was a humanist who believed that man can work out a better world for mankind as well as for himself. His approach to understand human personality and motivation is different from behaviourism and psychoanalysis. He critically examined the traditional approach of pain avoidance, pleasure seeking and tension reduction as the major sources of motivating behaviour. He has consistently argued that needs are arranged in a hierarchy. As one general type of need is satisfied, another higher order need will emerge and become operative in life. He developed his own system of needs and categorized them into two divisions: (i) deficit needs, and (ii) growth needs.

The needs of the first category include physiological needs, such as hunger and thirst. Once these needs are satisfied, the person seeks to satisfy safety needs—love, need, belongingness need and esteem needs. Under the second category, there is only

one general need called "self-actualization". The second important concept of Maslow is that each individual differs in nature, which should be supported and encouraged. He criticized the views of those psychologists who believed that man is selfish, evil and anti-social. Maslow believed that there are degrees of humanness. He went slightly beyond other need theorists by postulating an order of potency or priority with regard to structuring of needs within the person.

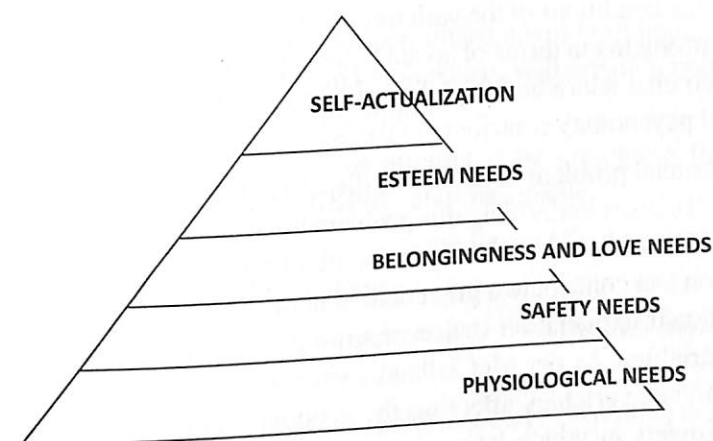


Fig. 4.1 Maslow's Theory of Motivation

Maslow developed a hierarchical order of needs from physiological to self-actualization needs. The order of needs started from basic survival or lower order needs to higher order needs. The hierarchy goes follows:

- Physiological needs
- Safety needs
- Belongingness and love needs
- Esteem needs
- Self-actualization need

We can see from the hierarchy of needs that for self-actualization, it is necessary that a person should not worry about his survival needs. He should enjoy his job. The person should feel satisfied in his social relation in family, society and in his job.

Maslow's theory emphasizes that motivation to work is rooted in the fulfillment of various categories of needs which range from physiological to self-actualization.

Some of the characteristics of self-actualizers are as follows:

- Demonstration of an efficient perception of reality and acceptance
- Acceptance themselves and others
- High degree of spontaneity and simplicity
- Problem-centred orientation
- Privacy and detachment
- Autonomous and independent of the environment
- Appreciation of 'basic goods of life' with continued freshness and pleasure;
- They at times show mysticism
- Identify with mankind
- Development of deep interpersonal relations
- Democratic in outlook
- They keep means and ends distinguishable
- Sense of humour

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- Creative
- Non-conformists

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4.5.3 Theory of Achievement Motivation

Theory of achievement motivation has drawn the attention of psychologists, sociologists and educators in recent years. Everyone is aware of the fact that wide disparities exist in the economic conditions of the various countries of the world. Psychologists thought about these problems in terms of social beliefs, political set-up, distribution of power and even their characteristic life philosophy and psychology. How can understanding of individual psychology contribute to the worldwide problems of economic growth?

This crucial problem of economic disparity among the nations of the world and psychological causes underlying this problem were attacked by David C. McClelland of Harvard University. He holds the view that psychological study of the individual and the nation can contribute a great deal in understanding this problem. He rejected the conventional explanation that economic growth can be explained in terms of economic variables. As per McClelland's viewpoint, psychological and sociological factors are major variables affecting the economic growth. He wrote a book, *The Achieving Society* in which he advanced his new concept of economic growth of a nation. He argued in his book that the rise of capitalism cannot be explained and understood on the basis of economic factor alone. He believes that changes in the fundamental beliefs and attitudes of men gave impetus to economic growth in certain countries.

According to him, human beings differ from one another in the strength of the achievement motive. It is this difference in the strength of motivation to achieve that is important in understanding the differences in the economic growth of nations.

The theory of achievement motivation was developed by McClelland and his associates in 1951 at the University of Harvard. He defined motive as, 'a reintegration of a change in a fact by a cue and anticipation of a future change in affect contingent upon certain actions'. The definition given by him has two important terms, which need further explanation. The first term is "reintegration", which means re-instatement of psychological process in the conscious as a result of the stimulation by an environmental event. Second is, "cue", which is the cause of affect in arousal in the individual. For example, if a boy sees his old teacher after a long time, the perception of the teacher works as cue, which arouses affective feelings and the whole psychological process is re-instated. Thus, for motivation two factors are important: environmental cue and the affective arousal in the individual. According to him, all human motives are learned in the environment irrespective of their nature.

Development of achievement motive is affected by a number of variables in home, school and society. Home plays an important role in the early training of children for the development of attitudes and motives. Parental expectation and guidance to a child develops need for high achievement in life.

The society and its social philosophy is an important variable in developing achievement motive. There are communities, which are achievement-oriented. There are other societies, which believe in fate and leave everything to God.

A child normally enters school at the age of five years. Before joining school, a child gathers many experiences, which become an integral part of his personality and form his attitude towards life, but even then the school can help a lot to sharpen his

already acquired experience and develop positive attitude in children. A teacher can play a very crucial role in the development of achievement motive by the following methods:

- The teacher should make clear the importance of achievement motive in life by means of telling the stories of great men and their achievements from all walks of life.
- The teacher should provide a proper environment both inside and outside the class. The teacher's attitude and enthusiasm will create a better environment for the achievement motive in children.
- The teacher will succeed in his attempt if he convinces the students that developing a new motive is realistic and reasonable.
- The teacher should relate the motive with future life of the students and assign independent responsibility to them.
- The teacher should make clear to the students that the new motive will improve their self-image.
- The teacher should emphasize upon the fact that new motive is an improvement on prevailing cultural values.
- The teacher should make students committed to achieving concrete goals in life related to the newly developed motive.
- The teacher should ask the students to keep the record of their progress towards their goal.
- Self-study should be emphasized.
- The teacher should make an effort to develop conducive social climate in the class so that every individual should feel that he belongs to a group.

4.5.4 Psychoanalytic Theory of Motivation

The concept of motivation in psychoanalysis developed against the traditional rationalistic interpretation of behaviour, which accepted the proposition that a man acts in any particular way because he has reasons for acting as he does. Freud objected to the theory of pure intellectualism as an explanation of human behaviour. He revolutionized the theory and practice of psychology by proposing unconscious motivation as an explanation of behaviour, and further advocated that reasons of behaviour can be found by analysing certain procedure of psychological analysis (psychoanalysis), which can disclose the pattern of forces and energies which led to the action. The advantage of this approach was that behaviour was explainable by psychological laws.

Freud introduced the concept that causes of behaviour can be determined by exploring the unconscious personality of the individual. He on the basis of observation of his mental patients and their treatment, developed certain concepts to explain behaviour.

One of the important concepts is equilibrium. According to this concept, nervous system discharges an increase in excitation through any appropriate action, motor or associative. In 1915, he introduced the concept of instinct. He held that instincts are the internal sources of stimulation. The individual, in order to reduce stimulation, is activated to work. He conceived two instincts—life and death instinct. The discharge

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of tension is called "primary process". Tension may be discharged through hallucinatory images in the absence of motor activity.

The tendency to discharge energy through pre-established channels is called "secondary process". Tension can only be reduced by finding an outlet through constraints and inhibitions that the ego places upon its discharge. Personality, according to Freud, is constituted by three major systems: id, ego and the superego. All these three systems interact with each other and behaviour is the result of the constant interaction among these three systems.

The id strives to discharge its instinctual energy for immediate gratification of its urges. It operates on the principle of hedonism. The ego operates on reality principle. It formulates plans at the cognitive level to satisfy the demands of the id according to the situations in the environment. The superego inhibits the anti-social impulses of the id to persuade the ego to substitute moralistic goals for practical ones and to strive for perfection. The superego controls the id and the ego.

In a well-adjusted person, the relationship among the id, the ego and superego is normal. In a maladjusted person the relationship is disturbed. Freud claims that we can understand the behaviour of the individual if we know the components of his life.

4.5.5 Theory of Intrinsic Motivation

Traditionally, behaviourists have explained behaviour in terms of certain biologically inherent drives such as hunger, thirst, sex and maternal behaviour and a number of other physiological drives. These physiological drives are produced as tissue needs of the organism. These drives are the basis of more complex motives such as prestige, money and safety, etc. and they develop out of the physiological needs through the process of learning.

Harlow and associates (1950) have developed a new theory of motivation called theory of intrinsic motivation. Intrinsic motivation is that tendency to activity, which arises when the resolution of tension is to be found in mastering the learning task itself; the material learned provides its own reward. If the work is done because doing it is satisfying, if the work carries its own reward, if it is done for its own sake, we can say that motivation is intrinsic.

Harlow and associates (1950) have conducted experiments on monkeys to show the importance of the intrinsic motivation. They have reported that monkeys solved problems without being offered extrinsic reward. They have also reported that introducing an extrinsic reward made learning less efficient. Several experiments have been conducted on manipulative, exploratory and curious behaviour on animals and small children, which give evidence of intrinsic motivation.

4.5.6 S-R Theories of Motivation

Motivation is the explanation of human behaviour which depends on our concept of the nature of man. According to S-R theories, man is a machine which is governed by fixed principles; and motivation of behaviour originates from physiological drives. The behaviour of the organism can be predicted on the basis of the cause-effect relationship in an objective way. Motivation is an urge to act, which results from stimulus. The stimulus may be internal or external. Behaviour is not related to any purpose.

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S-R theorists emphasize the importance of past experiences to explain the causes of present behaviour. On the other hand, cognitive field theorists view man as a purposeful, reflective and creative self. The concept of motivation is quite different from S-R theories in cognitive field theory. Motivation emerges from psychological situation, which is created by disequilibrium in the life-space of the individual. All behaviour is goal-directed. The individual when moves towards a goal, is thwarted by barrier, following which a tension is created, which the individual tries to remove. Release of tension by proceeding towards a goal is motivating. Success and failure work as motivator. When one successfully completes an act, this motivates him for further goal. Cognitive field theories emphasize the importance of present experiences. It is, as a matter of fact, a situational approach to motivation and behaviour.

S-R theories can be classified into two broad categories: (i) S-R theories without reinforcement, and (ii) S-R theories with reinforcement. Under non-reinforcement theorists come Pavlov, Watson and Guthrie who emphasized the importance of recency and contiguity between S-R for learning to occur. Some psychologists hold the view that in classical conditioning, UCS (food) works as a reinforcer. As regards Guthrie, he dealt with motivation in purely associative terms. He did not introduce the concept of motivation as such but he talked about maintaining stimuli, which means that for each physiological condition such as hunger and thirst, there are characteristic internal stimuli, which help to maintain the behaviour of the organism throughout the learning task.

4.6 TRANSFER OF LEARNING AND ITS THEORIES

The idea of transfer is basic to education. Education is considered to be a preparation for life. Whatever students learn in educational institutions, is useful only when they can apply the same in the everyday life. This application or *carry over* learning from one act of learning to another is called 'transfer of learning'. Whatever is taught implies the application of knowledge in various subjects and fields. Whatever is taught in the schools, it is assumed that children will use that knowledge, skills, attitudes and information to solve problems of life after completing their formal education. Arithmetic is taught on the assumption that it will be used in day-to-day life to handle the problems involving the use of arithmetic. Civic is taught on the assumption that its knowledge would be helpful to face social problems successfully.

Children are required to do addition and subtraction of fractions in algebra. The teacher points out to them that the principle is the same as that of addition and subtraction of fractions in arithmetic. This implies that transfer of learning arithmetic takes place in the learning of algebra.

There are many educators who believe that subjects like mathematics, English, language and science, etc., are superior to other subjects like economics, history, arts, crafts and home science as they are more helpful in sharpening the intellect of the students. The intellect so sharpened, they think, can be profitably employed in the performance of any other activity which may or may not be directly related to the subjects studied.

Traditionally children had been given long poems to memorize, long mathematical tables to learn by rote and a huge store of material to be committed to memory. It was believed that such learning was meant for disciplining the mind.

Check Your Progress

11. Define motivation.
12. List the primary functions of motivation.
13. Name the steps in hierarchical order of needs from physiological to self-actualization needs.
14. What does Maslow's theory signify?

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4.6.1 Definition of Transfer of Learning

For having an adequate understanding of the term transfer of learning, we may consider the following definitions:

1. M.J. Peterson (195) — 'Transfer is generalization, for it is the extension of idea to a new field.'
2. L.D. Crow and A.C. Crow (1963) — 'The carry-over habits of thinking, feeling or working of knowledge or of skills from one learning area to another usually is referred to as the transfer of training.'
3. B.L. Bigge (1964) — 'Transfer of learning occurs when a person's learning in one situation influences his learning and performance in other situations.'
4. H.C. Ellis (1965) — 'Transfer of learning means that experience or performance on one task influences performance on some subsequent task.'
5. K. Lovell (1970) — 'Transfer of learning is the effect which some particular course of training has on learning or execution of a second performance. Such an effect may be of a helpful nature or it may hinder.'
6. Guthrie and Powers (1973) — 'Transfer may be defined as a process of extending and applying behaviour.'

A comprehensive definition of transfer of learning would mean the application or carry-over of knowledge, skills, attitudes, habits, values or other responses from the situation in which they were initially acquired to some other situation for which they were not specifically learned.

There is no doubt that almost all educational and training programmes are built upon the premise that the learners have the ability to transfer what they have learnt in one situation to another. This relationship has a great significance for any educational practice as it lends importance and faith to the usefulness of formal education. Learning becomes functional only when it enables the students feel confident that they would use their experiences and skills obtained in the school in their day-to-day life.

The very existence of our educational institutions is based on the assumption that the knowledge, skills and attitudes developed by them in the students will be transferred to life situations. The following issues arise in connection with the study of transfer of learning:

1. What are the areas in which transfer of training takes place?
2. What is the degree of transfer of training from one area to another?
3. How best transfer of learning can take place?
4. Is transfer of training possible in reasoning?

Areas of Transfer of Learning

The scope of transfer of learning is very wide. Some of the important areas of transfer of learning are as under:

1. Transfer from knowledge to knowledge
2. Transfer from knowledge to skill
3. Transfer from knowledge to behaviour
4. Transfer from attitude to attitude
5. Transfer from attitude to behaviour

4.6.2 Types of Transfer of Learning

Important types of transfer of learning are as follows:

- **Lateral transfer:** It is the most common form of transfer to occur. Suppose a child has been taught the addition and subtraction and he understands that $15 - 8 = 7$ in the context of beads or blocks or other subjects used in the classroom by the teacher, it is hoped this understanding would transfer to other situations. For example, the child at home removes 8 apples from a basket containing 15 apples and understands that there would be 7 left. This is an example of lateral transfer. In this case, the child has made use of the understanding and skill learnt in the school in learning situations outside the school.
- **Sequential transfer:** The contents of the subjects of school curriculum are divided into sequent units. One idea leads to another and both ideas have some relationship to the third idea to be taught.
- **Horizontal transfer:** Lateral and sequential transfers are called horizontal for the learner, and is within the same behavioural category in making the transfer.
- **Vertical transfer:** Vertical transfer of learning implies facilitating the higher behavioural level in vertical manner by the lower level of learning.
- **Bilateral transfer:** This type of transfer takes place when training imparted to one lateral automatically transfers to another. Training in the use of pen by the right hand transfers training to the left.

Positive, Negative and Zero Transfer

A positive transfer takes place when the learning of a particular task facilitates the subsequent-learning of another task. But on the other hand, if learning a particular task interferes with the learning of a subsequent task, it is called a negative transfer. If, however, learning of a particular task makes no difference whatsoever to the learning of a subsequent task it is said to be zero transfer or no transfer of learning from one task to the subsequent task.

Once a child has learnt to misspell a word, it is difficult to correct it, especially if the child has been writing it for a long time. Similarly, if a child has developed faulty handwriting, it is more difficult to remedy it than to teach him to write well from the beginning. These are examples of negative transfer.

4.6.3 Theories of Transfer of Learning

Important theories of transfer of learning are discussed below.

1. Theory of Mental Discipline.
 2. Theory of Identical Elements or Components.
 3. Theory of Generalization of Experience.
 4. Theory of Ideals.
 5. Gestalt or Relationship Theory.
1. **Theory of Mental Discipline:** General transfer of training through mental discipline is the oldest theory but hardly accepted by the modern psychologists. The principal feature of the theory of mental discipline is that the mind or its faculties such as memory, reason, will and perseverance are the muscles of the mind, and like muscles of body they are strengthened through exercise and later on function automatically in all situations and areas in which they are

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involved. It was thought that the rigorous study of Geometry can train the faculty of reasoning and it is so trained in a person that he can reason well in the realms of mathematics, social studies, philosophy and business. This theory was first challenged by William James. Experiments by James and Sleight show that one can hardly improve memory for all situations in which it is called for by rigorously exercising it in any one specific situation.

Thorndike did a lot of research work on this problem and came to the following conclusion: 'The notions of mental machinery which being improved for one sort of data held the improvement equally for all sorts, of magic powers which being trained by exercise of one sort to a high efficiency, held that efficiency whatever they might be exercised upon, and of the mind as a reservoir for potential energy which could be fired by any one activity and drawn on for any other—have now disappeared from expert writing on psychology.' This sets limits of formal discipline.

A.G. Wesman (1945) concluded on the basis of his studies that there is no clear-cut superiority of any subject as regards the amount of transfer.

2. Theory of Identical Elements or Components: Thorndike and Woodworth were the main founders of this theory. On the basis of their experiments, carried out in 1901, Thorndike and Woodworth concluded that transfer of learning occurs from one situation to another on account of the presence of identical twins. The theory implies that learning is facilitated in the new situation to the extent that identical elements which occurred in an earlier situation are present in the new situation. The similarity of elements can be either in the subject-matter or in procedure or in attitudes.

Peter Sandiford (1941) stated: 'This theory of identical elements is a perfectly reasonable one. Out of the millions of specific reactions, each with its specific connection in the nervous system, some of them are bound to be common to several situations. The greater the number of these common elements, the greater will be the transfer effect.'

According to this theory, addition is supposed to improve multiplication on account of lots of additive processes required in multiplication tables. Learning of one language helps the learning of the other as the methods of learning used in two languages have the common elements of vocabulary. In a simple way, it may be stated that the transfer of learning is in terms of 'identity of content, identity of procedure and identity of ideals.'

3. Theory of Generalization of Experience: C.H. Judd (1908) came to the conclusion on the basis of his experiments conducted on transfer of learning that transfer takes place to the extent to which a learner is able to generalize his experiences. Judd lays emphasis on the intelligence of the learner which enables him to understand and apply knowledge of principles or generalizations from one situation to another.

The theory states: 'The development of special skills, the mastery of specific facts, the achieving of particular habits or attitudes in one situation have little transfer unless the skills, facts, habits are systematized and related to other situations in which they can be utilized.' If we are trying to build good habits of study and work, it should be done in such a way that these are applicable in all subjects and not merely to one subject.

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4. Theory of Ideals: W.C. Bagley, who gave an explanation of transfer in terms of ideals asserted that generalizations are more likely to transfer, if they are regarded as of some value as desirable. According to him, generalization is not the whole story but it must be given an emotional sanction or be elevated to a plane of an ideal worth living for. Thus, the teacher should consciously seek maximum transfer values by emphasizing ideals of neatness, of love, of learning, tolerance for difference of opinion, and so on.

5. Gestalt or Relationship Theory: According to Gestalt psychologists, transfer of learning means that generalizations, concepts or insights which are developed in one learning situation are employed as a whole in other situations in which they are applicable. However, the transfer of generalizations or insights does not occur automatically. For transfer to occur, the pupil must perceive the relationships between the two situations, must understand that the generalizations gained through past experience are appropriate to the new situations and must have the desire to use the generalizations and to benefit by the perceived commonality.

4.6.4 Educational Implications of Transfer of Learning

In the curriculum, utility aspect should be kept in view. In selecting and planning the curriculum, the selection and arrangement of material in subjects should be such as they are closely associated with the day-to-day needs of the learners. This implies that the spellings of those words should be taught first which are used in every-day life of the learners. Similarly the kinds of readings they will use in their life should be given priority. Curriculum content should be related directly to vocational interests and ways of life. Mathematical symbols and formulas should be expressed in familiar terms to the students.

Superiority of one subject over the other in terms of transfer has little relevance. The degree of transfer depends upon the applicability of the outcomes of learning. As Thorndike pointed out: 'The differences are so small and the unreliabilities are relatively so large, that the influence of the subject studied seems unimportant. Indeed one subject was about as good as another.'

Conditions that facilitate transfer of learning are as follows:

1. Transfer of learning takes place when there is some similarity between two tasks.
2. It is not enough that there should be similarity between two tasks but the learner must realize that similarity.
3. Transfer of learning is more likely to occur if the learner is keen to use his old learning in the new situation.
4. Transfer of learning depends on the ability of the learner. The more intelligent a learner is, the more likely it is that transfer will take place. The impact of transfer of learning on the part of the learner also depends on the intelligence of the teacher.
5. The better the first task has been learnt the more likely it is that the learning will be transferred to the new situation.
6. Understanding of the underlying principles, i.e., arriving at generalizations, adds transfer of learning.

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7. When children discover principles for themselves, there is greater possibility of transfer than when they are told the principles.
8. The more experience children have, of applying a principle in different situations, the easier it will be for them to apply it in a new situation.

Role of the teacher in transfer of learning are as follows:

1. Subject-matter of all subjects should be taught and learnt in close contact with its applications.
2. Adequate experiences and practice should be provided with the original task for its transfer to other situations in learning.
3. Important features of a task should be identified so that differences and similarities with other tasks should be comprehended and proper relationships established.
4. Implications of concepts and rules in actual life should be thoroughly discussed to make its applications practicable.
5. Students should be guided to discover common essential features and relationships of situations which appear to be different superficially.
6. Students should be encouraged to develop proper generalizations.
7. Students may be motivated to see the significance of identical elements and components of ideas, skills, attitudes and objects.
8. Emphasis should be on the development of desirable flexible behaviour and not merely to apply it mechanically
9. While teaching abstract concepts, a number of illustrations and practical examples of applications should be given.
10. Relationships should be emphasized and the learners guided to perceive them within a subject, between the subjects and to out-of-school life project method is very useful in cutting across several subjects.
11. Discussions and debates should be arranged to develop the students' power of understanding relationships.
12. Field trips to important places of commercial, educational, economic, historical, cultural and scientific etc., help in developing proper understanding of life situations in the context of curriculum content.
13. Logical thinking should be kept in constant focus. Students may constantly be asked the *why* and *how* of generalizations.
14. Goals, outputs and objects of a particular activity should be made very clear to the students.

ACTIVITY

Make a flow chart on the basic postulates of the Achievement Motivation Theory.

Check Your Progress

15. What do you mean by 'positive transfer', 'negative transfer' and 'zero transfer'?
16. Name the important theories of learning.

DID YOU KNOW

Hull's learning theories were first presented in *Mathematico-Deductive Theory of Rote Learning* (1940), which was his collaboration with many other coworkers. In this theory, Hull expressed his findings through postulates stated in mathematical as well as verbal forms.

4.7 SUMMARY

In this unit, you have learnt that:

- Basically, learning is change in behaviour because of experience.
- There are three components of behaviour: (i) conative, (ii) cognitive and (iii) affective. The conative aspect refers to act or doing part. The cognitive domain means the meaningful aspect of behaviour. The affective domain is related to emotional or feeling part of the behaviour.
- When the needs of an individual are strong, he is compelled to act to satisfy those needs. So the process of learning starts with a need and then there is a drive to strive for its satisfaction.
- The learning in one situation can help in learning in another situation, but sometimes learning in one situation may cause obstacles in learning in other situation.
- Thorndike initiated the study of operant or instrumental conditioning with the puzzle box experiments on cats. B.F. Skinner conducted a series of experiments on animals and prepared ground for the use of the principles in human learning.
- Theories of learning attempt to explain the mechanism of behaviour involved in the learning process.
- Important characteristics of a theory are: (a) testability of its principles, (b) predictability of the outcomes of the actions, (c) comprehensiveness, (d) brevity, and (e) simplicity.
- Lewin's theory regards learning as a relativistic process by which a learner develops new insight or changes old ones. According to the theory, learning is not a mechanistic process of connecting stimuli and responses within a biological organism.
- Tolman's theory combines the advantages of stimulus-response theories and cognitive field theories.
- J.S. Bruner has suggested a model on concept attainment and structure in teaching. He proposed that economy in thinking and responding requires that we categorize phenomena according to their common attributes.
- Bruner identified four strategies in concept attainment: (1) simultaneous scanning strategy, (2) successive scanning strategy, (3) conservative focusing strategy, and (4) focus gambling strategy.

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- Hull emphasized the importance of the satisfaction of the needs of the children. These needs could be reduced or satisfied through some reinforcement. Hull's theory, therefore, is known as *need reduction* or reinforcement theory of learning.
- Gagne argues that learning tasks for intellectual skills can be organized in a hierarchy according to the increasing level of complexity: stimulus recognition; response generation; procedure following; use of terminology; discriminations; concept formation; rule application; and problem solving.
- Murray's theory of motivation has been influenced by dynamic approach of psychoanalysts and field theorists. He developed a detailed system of human behaviour on the basis of his extensive work on human psychology.
- The theory of self-actualization was developed by Abraham Maslow; who developed his own system of needs and categorized them into two divisions: (i) deficit needs, and (ii) growth needs.
- Freud objected to the theory of pure intellectualism as an explanation of human behaviour. He revolutionized the theory and practise of psychology by proposing unconscious motivation as an explanation of behaviour, and further advocated that reasons of behaviour can be found by analysing certain procedure of psychological analysis (psychoanalysis), which can disclose the pattern of forces and energies which led to the action.
- S-R theories can be classified into two broad categories: (i) S-R theories without reinforcement, and (ii) S-R theories with reinforcement.
- According to Gestalt psychologists, transfer of learning means that generalizations, concepts or insights which are developed in one learning situation are employed as a whole in other situations in which they are applicable.

4.8 KEY TERMS

- **Associated learning:** This consists of the facts and other objective materials that are learned because they are related to the primary learning and are logically brought into the lesson
- **Attribute:** A property or characteristic of an object which differentiates it from the other
- **Chain learning:** Consists of motor and verbal change in curriculum
- **Life-space:** The field of forces to which the individual is responding or reacting
- **Motivation:** The driving force that help causes us to achieve goals
- **Primary learning:** This includes learning of facts, principles and theories, etc., which are the main cores of lessons
- **Reinforcer:** A term in operant conditioning and behaviour analysis, which refers to the process of increasing the rate or probability of a behaviour
- **Theory:** Provides detailed systematized information of an area of knowledge; it serves as guidelines to conduct further research in the area.
- **Transfer of learning:** Application or carry over learning from one act of learning to another

4.9 ANSWERS TO 'CHECK YOUR PROGRESS'

1. There are three components of behaviour: (i) conative, (ii) cognitive and (iii) affective. The conative aspect refers to act or doing part. Learning related to this part of behaviour means acquiring skills to perform tasks like cooking, playing, dancing, knitting, jumping, crawling, talking, walking, singing, etc. The cognitive domain means the meaningful aspect of behaviour. The activities which require mental thinking like reasoning, analysing, interpreting, concluding, illustrating are included in this dimension of learning. The affective domain is related to emotional or feeling part of the behaviour. Changes that are brought about by performing activities related to emotions and feelings like happiness, sadness and anger are included in this domain.
2. According to the type of development, learning is classified as: academic learning, (ii) emotional learning, (iii) intellectual learning, (iv) moral learning, (v) motor learning, (vi) sensory learning, and (vii) social learning.
3. Chain learning consists of motor and verbal chaining. Verbal chaining is a matter of connecting together in a sequence two or more previously learned stimulus responses (S's - R's).
4. Learning is *vertical* when precision in performance is increased or when information is added to what has been already learned, and it is *horizontal* when what is learned is integrated and organized as a part of a functional unit of expanding experience.
5. A learning situation is a problem situation and the learner has to see the problem as a whole and find its solution by insight. The law of organization of perception as applicable to learning is the law of Pragnanz and four laws of organization subordinate to it—the laws of similarity, proximity, closure and good continuation.
6. The 'Law of Similarity' says that 'other things being equal, the stimuli that are more similar to one another will have greater tendency to be grouped'. Thus, learning similar things is easier than learning dissimilar things.
7. Bruner identified four strategies in concept attainment: (i) simultaneous scanning strategy, (ii) successive scanning strategy, (iii) conservative focusing strategy, and (iv) focus gambling strategy.
8. In 'focus gambling' strategy, the subject focuses on a correct card, but varies more than one attribute at a time. This technique can give early result if cards chosen yield a positive instance. If, however, the subject encounters a negative instance, he cannot tell which attribute was essential. In that case, he has to revert to simultaneous-scanning technique to test hypotheses. This strategy is called gambling since the subject takes a chance varying two attributes at a time.
9. Need implies a state of the organism in which a deviation of the organism which is necessary for survival from the optimum of biological conditions, takes place. When a need arises, the organism acts with a view to reduce the need. Hence, sometimes Hull's theory of learning is called need reduction theory.

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10. Gagne identified the following five major types of learning levels in his theory: (i) Verbal information; (ii) Intellectual skills; (iii) Cognitive strategies; (iv) Motor skills; and (v) Attitudes.
11. Motivation refers to all those phenomena which are involved in the stimulation of action towards particular objectives where previously there was little or no movement towards those goals.
12. The primary functions of motivation are as follows:
 - It energizes and sustains behaviour; and
 - It motivates and regulates behaviour.
13. Hierarchical order of needs from physiological to self-actualization needs has the following steps: Physiological needs; Safety needs; Belongingness; Esteem needs; Self-actualization needs.
14. Maslow's theory signifies that motivation to work is rooted in the fulfillment of various categories of needs, which range from physiological to self-actualization.
15. A "positive transfer" takes place when the learning of a particular task facilitates the subsequent learning of another task. But on the other hand, if learning of a particular task interferes with the learning of a subsequent task, it is called "negative transfer". If, however, learning of a particular task makes no difference whatsoever to the learning of a subsequent task it is said to be "zero transfer" or no transfer of learning from one task to the subsequent task.
16. Important theories of transfer of learning are as follows:
 - (i) Theory of Mental Discipline
 - (ii) Theory of Identical Elements or Components
 - (iii) Theory of Generalization of Experience
 - (iv) Theory of Ideals
 - (v) Gestalt or Relationship Theory

4.10 QUESTIONS AND EXERCISES

Short-Type Questions

1. What are the basic principles of learning?
2. Name the various theories of motivation.
3. How can you develop achievement motive?
4. Write a short note on Kurt Lewin's Field Theory.
5. What are the educational implications of Hull's Reinforcement Theory?
6. List the basic assumptions of Maslow's 'Self-Actualization Theory of Motivation'.
7. What are the different types of 'transfer of learning'?
8. Write a short note on the 'Theory of Ideals' of the transfer of learning.

Long-Type Questions

1. Write a detailed note on the physiological theory of motives.
2. Do you agree with the statement that Murray's theory of motivation has been influenced by dynamic approach of psychoanalysts and field theorists? Explain.
3. Explain the difference in the characteristics of the intrinsically-motivated learners and the extrinsically-motivated learners.
4. State the meaning of transfer of training. Is transfer of training possible? If so, describe its utility in education.
5. Explain various theories of training and their educational implications.
6. Describe the principles which facilitate transfer of learning.
7. Explain the meaning of transfer of learning and the role of the teacher.

4.11 FURTHER READING

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- Anastasi, A., and Urbina, S.; *Psychological Testing*, 7th edition, Prentice Hall of Private Limited, New Delhi, 1997.
- Gelder, M., R. Mayou and P. Cowen; *Shorter Oxford Textbook of Psychiatry*, Fourth edition, Oxford University Press, Oxford 2004.
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NOTES

UNIT 5 INTELLIGENCE

Structure

- 5.0 Introduction
- 5.1 Unit Objectives
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 - 5.2.1 Fourfold Classification of Definitions of Intelligence
 - 5.2.2 Historical Review and Evaluation of Definition of Intelligence
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5.0 INTRODUCTION

To quote Prof. Percy Nunn, 'you are forever you, and I, I'. It has been amply demonstrated by many psychologists that all persons do not have the same intelligence and all cannot do same work with the same speed and efficiency. The assumption that given the same opportunities all men will be equally successful is based upon faulty foundations. The intelligence tests are of a great use in the schools. To be a successful teacher, one must know one's pupils thoroughly and one must possess an instrument with which one can measure the intelligence of one's pupils and one must know the proper use of that instrument.

For instance, the Binet's rod of mental measurement is an instrument for the teacher to find out the exact calibre of the minds of his pupils. Intelligence tests help to discover whether a child is backward or dull or intelligent. It is not possible to gauge the intelligence of children without the use of mental tests. The children's intelligence cannot be estimated from the marks obtained by them in their school subjects. A child of 12 years and another of 14 years may be put on the same level if they obtain the same number of marks. But this is a defective method. Obviously, the child of 12 years is more intelligent than the child of 14 years in this illustration. Similarly, a child may be more industrious but comparatively dull and may score more marks than another child, who may in fact be more intelligent but less industrious. In this unit, we will discuss various aspects of intelligence in detail.

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5.1 UNIT OBJECTIVES

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

- Explain the concepts and types of intelligence
- Describe the important theories of intelligence as given by Thurstone, Guilford and Piaget
- Discuss the concept of emotional intelligence and multiple intelligence
- Discuss how to measure intelligence

5.2 CONCEPT, NATURE AND TYPES OF INTELLIGENCE

There is no agreed definition of intelligence. In fact, there are as many definitions of intelligence as there are writers on the subject. P.B. Ballard (1913) has observed 'While the teacher tried to cultivate intelligence and the psychologist tried to measure intelligence, nobody seems to know what intelligence was'. On account of the different ways in which intelligence is interpreted, it has become less acceptable and more exposed to criticism by psychologists. Nevertheless, it is traditionally acknowledged by the parents and the teachers that intelligence is the most important single variable which affects success in school and in life. In general terms, intelligence means the manner with which an individual deals with facts and situations. Intelligence is the aggregate or the global capacity of the individual to act purposefully, to think rationally and to deal effectively with the environment. To quote Prof. R.R. Kumria: 'Call it practical wisdom; call it commonsense; call it genius, it is just the same in different names and grades.'

5.2.1 Fourfold Classification of Definitions of Intelligence

A variety of definitions of intelligence have been suggested by the psychologists which can be classified into at least four distinct groups.

The first group of definitions places the emphasis upon the adjustment and adaptation of the individual to his total environment or to its limited aspects. According to this group, intelligence is general mental adaptability to new problems and to new situations of life.

The second group of definitions of intelligence stresses the ability to learn. The more intelligent a person, the more readily and extensively he is able to learn and enlarge his field of activity and experience.

The third group of definitions maintains that intelligence is the ability to carry on abstract thinking. This implies the effective use of ideas and efficiency in dealing with symbols, specially numerical and verbal symbols.

The fourth category refers to the operational definitions.

These categories of definitions are not, and perhaps cannot be mutually exclusive. They intersect and overlap at many points.

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I. Ability to adjust

1. *Binet* (1905)—'Ability of an individual to direct his behaviour towards a goal.'
2. *Boyniton*—'It is an inherited capacity of individual which is manifested through his ability to adjust and reconstruct the factors of his environment in accordance with the most fundamental needs of himself and his group.'
3. *Burt* (1949)—'It is the power of readjustment to relatively novel situations by organising new psycho-physical coordination.'
4. *F.N. Freeman* (1937)—'Intelligence is represented in behaviour by the capacity of the individual to adjust himself to new situations, to solve new problems, to learn.'
5. *Johnson*—'It stands for an ability to solve the general run of human problems to adjust to new situations.'
6. *J. Piaget* (1926)—'Adaptation to physical and social environment.'
7. *Peterson*—'It is a mechanical means for adjustment and control.'
8. *Pinter* (1921)—'The ability of the individual to adapt himself adequately to relatively new situations to life.'
9. *Stern* (1941)—'Intelligence is a general capacity of an individual, consciously to adjust his thinking to new environment.'
10. *Van Wagemen*—'It is the capacity to learn and to adjust to relatively new and changing conditions.'
11. *William James* (1907)—'It is the ability to adjust oneself successfully to a relatively new situation.'
12. *William McDougall* (1923)—'It is the capacity to improve upon native tendency in the light of past experience.'

II. Ability to learn

13. *Buckingham* (1921)—'Intelligence is the learning ability.'
14. *Calvin*—'It is the ability to learn.'
15. *Spearman* (1927)—'Intelligence may be thought of in terms of two abilities i.e., "g" or general and "s" or specific.'
16. *Thurstone* (1946) defines intelligence in terms of five primary abilities (discussed in the following pages).
17. *Woodrow*—'It is the capacity to acquire.'

III. Ability to do abstract reasoning

18. *C. Spearman* (1927)—'General intelligence which involves mainly the education of relations and correlates.'
19. *E.L. Thorndike* (1931)—'We may define intelligence in general as the power of good responses from the point of view of truth or fact.'
20. *Gates and Others* (1955)—'It is a composite organization of abilities to learn, to grasp broad and subtle facts, especially abstract facts, with alertness and accuracy, to exercise mental control and to display flexibility and sagacity in seeking the solution of problems.'

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21. Henry Garrett (1946)—'The abilities demanded in the solution of problems which require the comprehension and use of symbols, i.e., words, numbers, diagrams, equations, formulae.'
22. J.M. Hunt (1966)—'The technique that a child acquires for processing information supplied by his senses.'
23. L.M. Terman (1921)—'An individual is intelligent in proportion as he is able to carry on abstract thinking.'
24. Munn—'Intelligence is the flexibility or versatility to the use of symbolic processes.'
25. P.E. Vernon (1927)—'Allround thinking capacity or mental efficiency.'

IV. Operational Definitions

26. Boring (1948)—'Intelligence is what intelligence tests.'
27. Dockell (1970)—'Intelligence might be taken to mean "ability" i.e., what a person can do at a moment.'
28. D.O. Hebb (1949) describes three situations in which the term intelligence could be used.
29. D. W. Wechsler (1950)—'Intelligence is the aggregate or the global capacity of the individual to act purposefully, to think rationally and to deal effectively with the environment.'
30. G.D. Stoddard (1943)—'Intelligence is the ability to undertake activities.'
31. Hein—'Intelligence activity consisting in grasping the essentials in a situation and responding approximately to them.'
32. P.E. Vernon (1927)—'Intelligence is what intelligence test measures.'
33. Well—'Intelligence is the property of recombining our behaviour pattern as to act later in novel situations.'

5.2.2 Historical Review and Evaluation of Definition of Intelligence

A. Binet (1905), a French psychologist, was the first to take interest in intelligence. He defined intelligence as the ability of an individual to direct his behaviour towards a goal, to make adaptation in his goal-oriented behaviour when necessary, to know when he reached the goal. Comprehension, invention, direction and censorship: intelligence lies in these four words. A.L. Terman (1916) defined intelligence as an individual's ability to carry on abstract thinking. In the words of Thompson, 'the definition presented by Terman probably reflects most adequately our present functional definition of intelligence'. E.L. Thorndike (1926) further elaborated the definition given by Terman. He defined intelligence in terms of three somewhat independent dimensions: (i) attitude, (ii) breadth, and (iii) speed. In 1946, L.L. Thurstone identified the following more or less mutually exclusive components of intelligent behaviour.

S, or *space factor*: the ability to visualize flat or solid objects, heavily involved in mechanical aptitude.

N, or *number factor*: ability in the carrying-out of the rather simple numerical exercise similar to those used by a cashier.

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V, or *verbal comprehension factor*: ability to deal with verbal concepts, e.g., verbal reasoning, and vocabulary availability.

W, or *word fluency factor*: ability to produce words in a restricted context, i.e., a child may be fluent even though he has a small vocabulary.

M, or *memory factor*: ability to store and reproduce perceptual-conceptual materials.

Induction factor: facility in discovering the principle or rule that applies to a series of problems.

Deduction factor: only a small amount of evidence for—ability to apply a given principle to a series of specific problems.

Flexibility and speed to closure: ability to interpret instructions quickly. Facility to size up a problem situation quickly; flexibility is the ability to abandon one configuration in favour of a more promising one.

G.D. Stoddard and B.L. Wellman (1934) offer a seven-category definition of intelligence:

'Intelligence is the ability to undertake activities that are characterized by:

- (1) Difficulty,
- (2) Complexity,
- (3) Abstractness,
- (4) Economy,
- (5) Adaptiveness to a goal.
- (6) Social value, and
- (7) The emergence of originals and to maintain such activities under conditions that demand a concentration of energy and a resistance to emotional force.'

J.P. Guilford (1950) thinks that these definitions ignore the important concept of creativity and thus provide a narrow approach to intelligence

D. Wechsler (1950) concludes that general intelligence is more than a combination of the cognitive functions identified by Thurstone and others.

In Wechsler's view, general intelligence is influenced by certain conative factors like drive, will, perseveration and persistence; by certain emotional factors like anxiety and impulsiveness; and by other more general personality characteristics.

G. Thompson (1975) sums up the discussion in these words: 'There is no absolute definition of intelligence. A theoretical construct may be changed at any time. According to the law of parsimony, the simplest yet most fruitful definition will eventually prevail. Thurstone's approach to the definition and measurement of children's intelligence is challenging. Whether this approach will be more valuable than those of Binet and Terman is of course unknown.'

Intelligence and scholars of ancient India

Kautilya defines it as the ability for work.

According to Visnusarma, it is the power which enables human beings to control the world.

The *Brahmasutra* tells us that intelligence is the gift of God and it is fixed at birth.

The *Agnipurana* prescribes diet for infants to help the growth of their intelligence.

Agadhabuddhi or intelligence that cannot be measured or superior intelligence.

Mahabuddhi or great intelligence, *malin buddhi* or dull intelligence

Sthirabuddhi or calm intelligence.

Atpabuddhi or little intelligence.

In ancient India, intelligence was measured through conversation, physical features, gestures, gait, speech, changes in the eye and facial expression.

5.2.3 Chief Characteristics and Generalizations on Intelligence

Intelligence cannot be increased or decreased. The amount of intelligence that a person possesses is inherited and fixed. The amount though fixed does not reveal itself at the start of life. With the growth of the child, the amount inherited by a child also grows. The general belief is that the growth of intelligence stops and it reaches its limit at the age of sixteen or seventeen. It is true that a man of forty knows more than he was a boy of sixteen. But this does not mean that the amount of intelligence possessed by him has increased. This may be due to his experience. As regards his intelligence, his position remains the same.

- **Intelligence and influence of environmental factors:** It is certainly justifiable to assume that love, affection, concern and generosity judiciously bestowed on growing children, have very desirable effects. Poor environments retard development of intelligence.

The growth of intelligence of certain children may be checked due to certain unfavourable circumstances and when these are removed, intelligence begins to grow and functions normally.

- **Intelligence, adjustment and inventions:** An intelligent person has the ability to adjust himself to the changing circumstances with ease, efficiency and speed. He has the capacity to assimilate ideas very quickly and clearly. He can cope with new situations very successfully. All the inventions of the world can be attributed to persons of very high intelligence.

The unintelligent or the dullard fails to think of new situations. They are always guided by others. They lack originality.

- **Distribution of intelligence:** The majority of the school children, say about 60 per cent, are found in the I.Q. range 90–110 and are referred to as 'normal' or 'average'.

- **Intelligence and sex differences:** Generally speaking, the research studies show that the average scores of the sexes are strikingly similar.

- **Intelligence and race differences:** Every racial and cultural group contains some gifted children. Franz Boas states, 'if we were to select the most intelligent, imaginative, energetic and emotionally stable third of mankind, all races would be represented'.

5.2.4 Three Broad Areas of Intelligent Behaviour

Thurstone has suggested that we may recognize at least three broad areas of intelligent behaviour:

- Abstract Intelligence**—He defined this as the 'ability to understand and manage ideas and symbols, such as, words, numbers, chemical or physical formulas, legal decisions, scientific principles and the like...' In the case of students, this is very close to what is called scholastic aptitude.

- Mechanical Intelligence**—This includes, 'the ability to clean, to understand and manage things and mechanisms, such as a knife, a gun, a moving machine, and automobile, a boat, a lathe'.

- Social Intelligence**—This is the 'ability to understand and manage men and women, boys and girls to act wisely in human relations'.

Intelligence Curve

If we plot a measure of intellectual development against chronological age from birth to adolescence using a random subject we will obtain S = shaped curve (Figure 5.1).

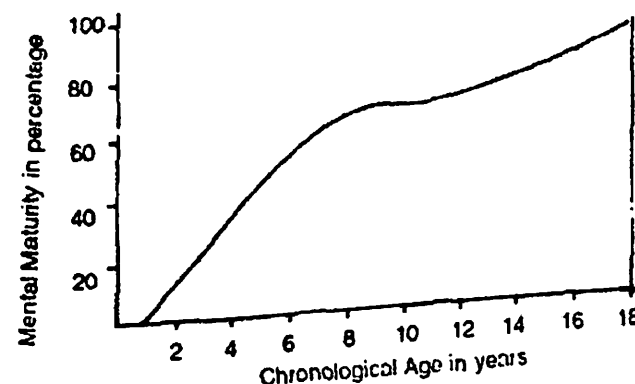


Fig. 5.1 Intelligence Curve

The following points come to light from the curve:

1. During early childhood, there is a period of relatively rapid growth of intelligence followed by a slower rate during adolescence.
2. During childhood, the curve is more or less linear.
3. Mental development reaches almost at its maximum during early adult years.

Non-definable nature of intelligence

Some argue, 'we can measure electricity without being able to define its precise nature. But we can put electricity to use and measure it. So we can use and measure intelligence.'

Intelligence and different occupations: Usually scholars, executives in business and government and scientist possess high abstract intelligence.

A successful civil engineer presumably possesses high abstract as well as high mechanical intelligence. Similarly, other types of engineers possess a combination of like abilities.

A successful criminal lawyer possesses high abstract as well as social intelligence.

Mechanics, expert carpenters and plumbers possess above normal mechanical intelligence.

Of course, these are crude generalizations.

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5.2.5 Types of Intelligence

The various types of intelligence are as follows:

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1. Naturalist intelligence

This type of intelligence designates the human ability to discriminate among living things (plants, animals) as well as sensitivity to other features of the natural world (clouds, rock configurations). This ability was clearly of value in our evolutionary past as hunters, gatherers, and farmers; it continues to be central in such roles as botanist or chef. It is also speculated that much of our consumer society exploits the naturalist intelligences, which can be mobilized in the discrimination among cars, sneakers, kinds of make-up, and the like.

2. Musical intelligence

Musical intelligence is the capacity to discern pitch, rhythm, timbre, and tone. This intelligence enables us to recognize, create, reproduce, and reflect on music, as demonstrated by composers, conductors, musicians, vocalist, and sensitive listeners. Interestingly, there is often an affective connection between music and the emotions; and mathematical and musical intelligences may share common thinking processes. Young adults with this kind of intelligence are usually singing or drumming to themselves. They are usually quite aware of sounds others may miss.

3. Logical-mathematical intelligence

Logical-mathematical intelligence is the ability to calculate, quantify, consider propositions and hypotheses, and carry out complete mathematical operations. It enables us to perceive relationships and connections and to use abstract, symbolic thought; sequential reasoning skills; and inductive and deductive thinking patterns. Logical intelligence is usually well developed in mathematicians, scientists and detectives. Young adults with lots of logical intelligence are interested in patterns, categories, and relationships. They are drawn to arithmetic problems, strategy games and experiments.

4. Existential intelligence

Sensitivity and capacity to tackle deep questions about human existence, such as the meaning of life, why do we die, and how did we get here.

5. Interpersonal intelligence

Interpersonal intelligence is the ability to understand and interact effectively with others. It involves effective verbal and nonverbal communication, the ability to note distinctions among others, sensitivity to the moods and temperaments of others, and the ability to entertain multiple perspectives. Teachers, social workers, actors, and politicians all exhibit interpersonal intelligence. Young adults with this kind of intelligence are leaders among their peers, are good at communicating, and seem to understand others' feelings and motives.

6. Bodily-kinesthetic intelligence

Bodily kinesthetic intelligence is the capacity to manipulate objects and use a variety of physical skills. This intelligence also involves a sense of timing and the perfection

of skills through mind-body union. Athletes, dancers, surgeons, and craftspeople exhibit well-developed bodily kinesthetic intelligence.

7. Linguistic intelligence

Linguistic intelligence is the ability to think in words and to use language to express and appreciate complex meanings. Linguistic intelligence allows us to understand the order and meaning of words and to apply meta-linguistic skills to reflect on our use of language. Linguistic intelligence is the most widely shared human competence and is evident in poets, novelists, journalists, and effective public speakers. Young adults with this kind of intelligence enjoy writing, reading, telling stories or doing crossword puzzles.

8. Intra-personal intelligence

Intra-personal intelligence is the capacity to understand oneself and one's thoughts and feelings, and to use such knowledge in planning and directioning one's life. Intra-personal intelligence involves not only an appreciation of the self, but also of the human condition. It is evident in psychologist, spiritual leaders, and philosophers. These young adults may be shy. They are very aware of their own feelings and are self-motivated.

9. Spatial intelligence

Spatial intelligence is the ability to think in three dimensions. Core capacities include mental imagery, spatial reasoning, image manipulation, graphic and artistic skills, and an active imagination. Sailors, pilots, sculptors, painters, and architects all exhibit spatial intelligence. Young adults with this kind of intelligence may be fascinated with mazes or jigsaw puzzles, or spend free time drawing or daydreaming.

5.3 THEORIES OF INTELLIGENCE

Psychologists have attempted to understand the structure of intelligence for which they have formulated several theories. Among the important theories, the following deserve special mention.

1. Spearman's Two-Factor Theory or Electic Theory

In 1904, Spearman, an English psychologist produced strong evidence based on his own researches that there was one fundamental ability underlying all cognitive functions. According to him, every task involving intellectual activity depended upon a general ability or "g" factor and a separate ability or "specific" factor. This view is popularly known as two-factor theory of intelligence, i.e., "g" factor and "s" factor. This "g" factor represents native intelligence. Thus, when we respond to any situation or perform an intellectual task, our general mental ability or "g" factor is responsible for part of our reactions and our specific ability in that particular task is responsible for the rest.

There is a large number of specific abilities, such as, ability to draw inferences, ability to complete sentences, ability to continue series of numbers, the ability to code messages, etc.

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2. Thurstone's Group Factor Theory or Anarchic Theory

L.L. Thurstone, an American psychologist, propounded the group factor theory of intelligence. According to him, intellectual activity is neither an expression of numerous highly specific factors as claimed by Thorndike, nor the expression primarily of a general factor which prevails in all mental tasks as Spearman believed. Instead, as revealed by factor analysis, certain mental operations have in common a primary factor which gives them psychological and functional unity and which distinctly separates them from other mental operations. These mental operations are said to constitute a group 'A', similarly, another group of mental operations have their own unifying primary factor and may be said to constitute a group 'B', and so on. Thus there are a number of groups of mental abilities, each of which has its own primary factor.

Thurstone proposed seven factors and called them "primary mental abilities". These are:

- (i) M—*Memory*: To be able to learn and retain information. Also to be able to recall the learned material.
- (ii) N—*Number*: To be able to understand quickly and with accuracy simple arithmetic computations.
- (iii) P—*Perceptual*: To be able to identify objects quickly and accurately.
- (iv) R—*Reasoning*: To be able to perceive and utilize abstract relationships. To be able to put together past experiences in the solution of new problems.
- (v) S—*Spatial*: To be able to deal with objects in space.
- (vi) V—*Verbal*: To be able to understand and utilize verbal ideas.
- (vii) W—*Word fluency*: To be able to think of words rapidly.

Spearman's theory is also known as the "*electic theory*" because it harmonizes elements from all the main types. Thurstone's theory is also known as the "*anarchic theory*", because he conceives of mind as consisting of a number of independent facilities.

3. Unitary Theory or Monarchic Theory

According to Monarchic attitude, intelligence is regarded as an adaptiveness which enables a creature to adjust itself to changing environment. This is a popular view which regards intelligence, as a unitary (monarch) faculty that determines the level of man's achievement in any intellectual enterprise he may take. Accordingly, inborn all-round mental efficiency is a sign of intelligence. Newton could have been a poet as well, had he turned his mind to poetry.

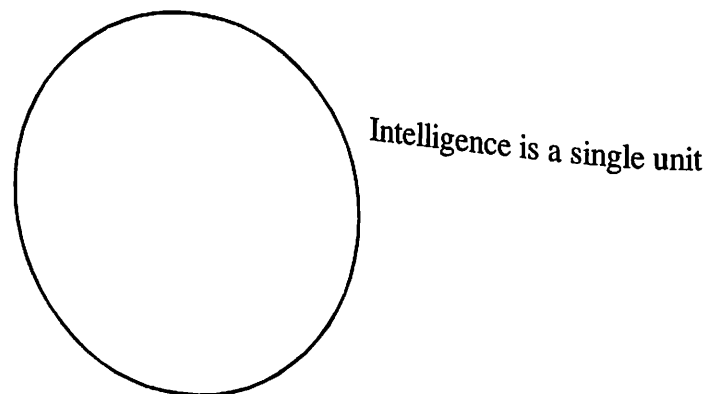


Fig. 5.2 Unitary Theory of Monarchic Theory of Intelligence

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4. Oligarchic Theory

This theory is criticized by the advocates of Oligarchic Theory. They say a person cannot be expert in all fields. Moreover, they cannot be mentioned in any single factor which means intelligence.

This theory is sometimes known as sampling theory of intelligence. Oligarchic theory was put forward by Prof. Thompson. According to this theory, intellectual abilities belong to certain groups. This theory maintains that cognitive abilities are manifestations not of a single commanding faculty, but of a few main intellectual powers or a group of abilities. For example, a child who is intelligent in one group of knowledge may not be intelligent in the other group. But he may be equally intelligent in the various subjects of that particular group. (Figure 5.3)

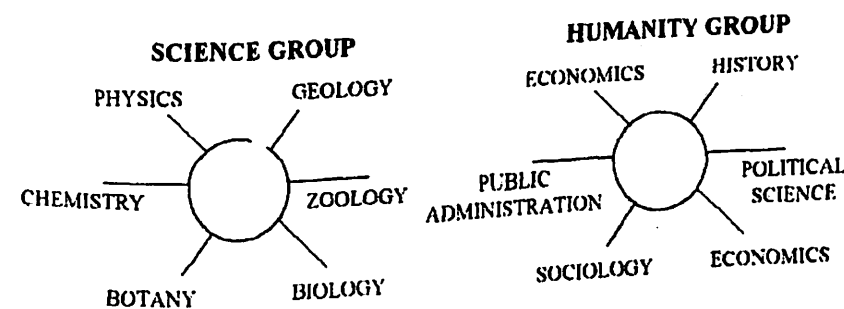


Fig. 5.3 Oligarchic Theory of Group Factor Theory of Intelligence

Educational implications of theories of intelligence

Spearman's Theory is criticized on the main ground that it fails to take into account sufficiently for specific types of abilities and towards the later years of his life. Spearman himself had begun to realize the existence of group factors.

Thorndike's Theory accords undue weightage to abstract intelligence. Guilford Theory of Intelligence seems to be the most comprehensive theory as it attempts to take into consideration all possible aspects of intellectual activity. This theory has several educational implications.

The SOI model provides knowledge about the specific ability of the students to guide them in the right direction. An analysis of the students' abilities by the guidance worker can suggest a reliable base on which future learning could be based.

The SOI model is useful in finding out the reasons of the unsatisfactory performance of the students in spite of their adequate intelligence.

The model points out that for understanding human learning and higher mental processes of thinking, problem-solving and creativity, etc., some drastic modifications would be needed in our theory of curriculum construction and methodology of instruction.

The model has explored 120 intellectual abilities and this enables us to find out whether or not we are paying adequate attention to each of them. If not, how to improve.

The model guides us to devise enrichment programmes for the creative and the gifted children.

The model discards the ideas of transfer of learning and stresses that learning of specific skills should be our focus of attention.

5.3.1 Thurstone's Theory of Intelligence

Louis Leon Thurstone made significant contributions in many areas of psychology, including psychometrics, statistics, and the study of human intelligence by developing methods for scaling psychological measures, assessing attitudes, and test theory, among many other. The statistical techniques developed by Thurstone are his most enduring contribution to psychology.

Thurstone stressed that *g* was a statistical artifact that resulted from mathematical procedures used to study it. Thurstone found that intelligent behaviour does not arise from a general factor but emerges from seven independent factors which he called *primary abilities*—word fluency, verbal comprehension, spatial visualization, number facility, associative memory, reasoning, and perceptual speed. When Thurstone analysed mental test data from IQ samples of people with similar scores, he found that they had different primary mental abilities.

However, when Thurstone administered his tests to an intellectually heterogeneous group of children, he was unable to find that the seven primary abilities were entirely separate, rather he found evidence of *g*. Thurstone made a mathematical solution that resolved these contradictory results and his final version of his theory was a compromise that had the presence of both a general factor and the seven specific abilities. This helped to lay the groundwork for future researchers who proposed hierarchical theories and theories of multiple intelligences.

Thurstone is responsible for introducing the standardized mean and standard deviation of IQ scores instead of the Intelligent Test system introduced by Binet. He is also responsible for developing the Thurstone Scale.

Thurstone's work in factor analysis led him to formulate a model of intelligence center around "Primary Mental Abilities" (PMAs), which were independent group factors of intelligence that different individuals possessed in varying degrees. Thurstone opposed the singular general intelligence that were part of the scores of all psychometric tests and was expressed as a mental test. In 1935 Thurstone, along with Thorndike and Guilford started the journal *Psychometrika* and also the Psychometric Society. He became the society's first President in 1936. Thurstone's contributions to methods of factor analysis has contributed in establishing and verifying the psychometric factor structures that came later, and has influenced the hierarchical models of intelligence in use in intelligence tests such as WAIS and Stanford-Binet IQ Test.

It was suggested that there were equally important factors or aptitudes in addition to 'G'. The multifactor theory is based on factor analysis and statistical procedure that attempts to describe as simply as possible the main factors that account for the relationship among several different tests. L.L. Thurstone was the first psychologist who used this procedure by correlating the results from approximately 60 separate tests. The factor analysis of the resulting correlation yielded the following abilities that provide the basis for the construction of the primary mental abilities (PMA) test. According to this theory, intelligence neither consists of two factors as proposed by Spearman nor multifactors as developed by Thorndike.

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The six primary factors emerged are as follows:

- | | |
|------------------------|---|
| 1. Number factor (N) | Ability to do numerical calculations rapidly and accurately. |
| 2. Verbal factor (V) | Found in test involving verbal comprehension. Verbal factor may take two forms: (i) Verbal fluency, which is the ability to deal with relationships expressed in words. (ii) Verbal comprehension, which refers to on |
| 3. Space relations (S) | Involved in any task in which the subject manipulates an object imaginary in space. |
| 4. Memory (M) | Involving the ability to memorize quickly and retain for a longer time. |
| 5. Reasoning (R) | Found in tasks that requires the subject to discover a rule or principle. |
| 6. Word fluency (W) | Involved whenever the subject is asked to think of isolated words at a rapid rate. |
| 7. Perceptual speed | It is the ability to find out quickly similarities and differences in groups of designs. |

Today there is rather general agreement among the psychologists that there are many intellectual dimensions. However, there remains a factor that might be called general scholastic aptitude, a conclusion supported by the fact that factors on such tests as the PMA are not completely independent but are correlated to some extent with each other. Despite the analytic nature of the multifactor approach, it is still based on a limited conception of intelligence since little weight is given to social intelligence, mechanical and to abilities in special fields such as athletic, music and drama, etc.

5.3.2 Guilford Theory of Intelligence

This three-dimensional theory was developed by Guilford and his associates in the psychological laboratory at the University of Southern California in 1966. The work on Guilford's Theory of Structure of Intellect began on this theory in 1956.

Guilford conceives of intellectual functioning as having three dimensions: (i) operations, (ii) content and (iii) products. *Operations* are processes involved in intellectual behaviour-cognition. memory, divergent thinking, convergent thinking and evaluation. The *content* of these operations may be figural, symbolic, e.g., letters, numbers, semantic e.g., words or behavioural e.g., information about other persons, behaviour, attitudes, needs, etc. The *products* may be—units, classes, relations, systems, transformations and implications. Thus, the model contains 120 cells (5 operations \times 4 contents \times 6 products); each of which represents a distinct factor which is measured by a separate test (Figure 5.4).

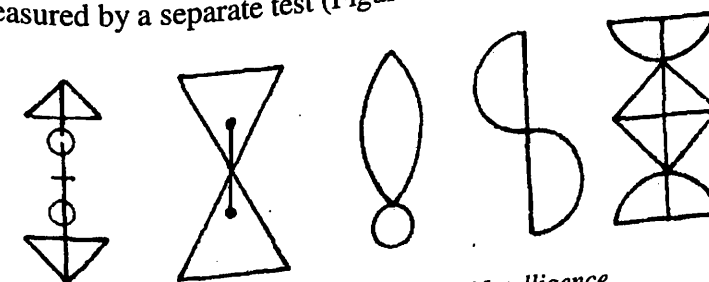


Fig. 5.4 Guilford's Module of Intelligence

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Guilford suggests that the five processes act on the four units to produce one of six cognitive products. The six products are units of a single word or idea, classes, a relationship between or among units or classes, systems, an organized sequence of ideas, transformations, a change or redefinition of a unit or class, and implications, predictions of the future.

Guilford believes that each person is a unique composite of a great many different intellectual abilities. Each intellectual functioning involves three components: a cognitive operation, specific content and a specific product.

Some of the elements of the structure of intellect are as follows:

- **Cognition:** It refers to discovery, rediscovery or recognition.
- **Memory:** It is a primary mental process. It means the retention of what is recognized.
- **Divergent thinking:** This implies thinking in different directions, seeking and searching some variety and novelty.
- **Convergent thinking:** In this type of thinking what results is the right or best answer.
- **Evaluation:** It is about reaching decisions or making judgments about the information received.

This model of Guilford is not a basic model. It can be compressed and expanded. When compressed, intelligence consists of only 18 factors ($3 \times 2 \times 3 = 18$), i.e. instead of six products, we have three; five operations can be reduced to two (for example, convergent and divergent thinking are one, memory can be deleted, evaluation is based on cognition and as such is one. As such five operations get reduced to two and four contents to three.

When expanded by breaking, each of the products, operations and contents intelligence composes of $(8 \times 12 \times 10) = 960$ mental abilities.

However, Guilford says that S—R bond is the real thing. Eysenck also proposed compressing in his own way. According to him, intelligence consist of nine factors. There are three products, three contents and one process or operation ($3 \times 1 \times 3 = 9$). This can be safely compared to Thurstone's model, which states that there are seven primary abilities.

A second way of classifying the intellectual factor is according to the kind of material or content involved. It involves the following factors:

- **Visual content:** It is concrete material, which is perceived through our senses, i.e., size, form, colour, etc.
- **Symbolic:** It consists of letters, digits and other conventional signs.
- **Semantic content:** It is in the form of verbal meanings or ideas, which we get from others.
- **Behavioural content:** It means social behaviour in society.
- **Auditory:** This relates to factors relating to the senses.

When a certain operation is applied to a certain kind of content, following products are be involved:

- **Units:** Understanding the meaning of words, visuals, auditory and symbolic units.
- **Classes:** It means classification of words and ideas.
- **Relations:** It implies discovering relations between various concepts and objects.

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- **Systems:** The ability to structure objects in space, to structure symbolic elements and to formulate problems.
- **Transformations:** The ability to look into the future lines of development or to suggest changes in the existing situations.
- **Implications:** The ability to utilize present information for future ends.

Educational implications of the SI model

The educational implications of the SI model are as follows:

1. The SI model has explored 150 intellectual abilities and this enables us to find out if we are paying adequate attention to each of these. If not, it explains how to improve.
2. The model provides knowledge about the specific ability of students to guide them in the right direction.
3. The model points out that for understanding human learning and higher mental processes of thinking, problem-solving and creativity, significant modifications would be needed in the theory of curriculum construction and methodology of instruction.
4. The model guides us to provide enrichment programmes for creative and talented students.
5. The model is useful in finding out the reasons of unsatisfactory performance of a student in spite of his high level of intelligence.
6. The model discards the idea of transfer of learning and stresses that learning of specific skills should be the focus of our attention.

5.3.3 Piaget Theory of Intelligence

The processes lie under the adaptive behaviour from birth to adolescence. Piaget studied developmental process of understanding knowledge and working of the child's mind. His system can be of great value to assess teaching, structure and sequencing of subject matter in the curriculum and organization of various activities in and outside the classroom.

Basic concepts: schema, assimilation and accommodation

Piaget was interested in the developmental process and the change in behaviour. The concept of schema applies to the sensorimotor behaviour of the infant. The infant sucks the breast of his mother; looks at the objects of environment; listens to different voices in his environment; and finally tries to comprehend, conceptualize the articles, animals, space and many other cognitive structures. The process of conceptualization is closely dependent upon the sequences of behaviour employed by the infant to adapt to the environment. Although a particular scheme derives its name from the behaviour sequence it describes, it implies some internal organizational disposition that enables the sequence to adopt itself to a variety of conditions. According to Piaget, sensorimotor sequence and cognitive structures are of the same class because they are continuous processes. As the development proceeds, each scheme enlarges and changes and is coordinated with other schemes to form more complex schemes.

The sensorimotor schemas develop out of the reflex behaviour of the infant. They are reduced and internalized as they continue to function and are gradually

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converted into cognitive schemes. As the sensorimotor schemas are converted to the more covert and symbolic structures, they become generally synonymous with the processes known as concepts, generalizations, principles, constructs and plans.

Piaget believed that schemas (cognitive structures) exist in primitive form at conception and progressively develop during the lifetime in certain systematic ways. According to him, cognitive structures contain all the necessary energy for their emergence and development without requiring some motivating force.

The schemas acquired in infancy are exercised and changed in later life. The process of change is accounted for by the psychological processes constantly at work called "assimilation and accommodation".

At the sensorimotor level, when the infant acquires grasping schema, he picks up things and objects and grasps them. This scheme of grasping objects is called assimilation. Suppose, the grasping schema is inadequate, the object is too small, it must change in order to manage the new situation. This is accommodation at work. The play activities of infants are the examples of the process of assimilation. The infant will take a stick and assimilate it to his available schema, making it into a horse, cow or man. The example of accommodation is imitation of others. In the process of imitation, the child suppresses the available scheme and strives to establish a new schema. The structures or the schemes change from one stage to another by the process of equilibration. Through the processes of assimilation and accommodation, the organism attempts to adapt to the environment to maintain balance with the changing environment.

Piaget's developmental stages

Jean Piaget advanced a new theory of development of cognitive abilities. He proposed that cognitive development proceeds through an orderly sequence of stages. The important concept of his theory of cognitive development is not the age at which the child moves from preferred mode of response to another but the fixed progression from one stage to another. The child cannot adopt the strategies of a later stage at an early stage of development without having first acquired and exercised the strategies of the earlier stage.

Ausbel commenting upon the development stages of Piaget writes: 'Piaget's stages are identifiable, sequential phases in an orderly progression of development that are qualitatively discriminable from adjacent phases and generally characteristic of most members of a broadly defined age range.'

The stages of cognitive development are related in that they represent forms of adoption but these forms are qualitatively different; that is the adaptive functions are transformed as the child moves from one stage to the next. This theory of development is quite different from the theory of associationists which emphasizes the gradual accumulation of responses.

Stages of cognitive development

Jean Piaget divides the stages of cognitive development into the following categories:

1. **The period of sensorimotor adaptation (since birth to 2 years):** The period from birth to 2 years is marked by an extraordinary development of the mind. The infant starts from reflex domination and reaches the stage of sensorimotor schemas. The development of this period is very important for future life.

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The intellectual development at this age is marked by four fundamental characteristics: (a) object concept formation, (b) coordinated space, (c) objectified causality and (d) objectification of time.

The objects exist in the psychological world of an adult irrespective of their physical presence before the adult but in the world of the child they only exist when they are physically present and the child looks at them, grasps them and acts with them. As soon as they move out of his range of acting, grasping and listening, they stop existing for the child. In the first year of life, the child develops the concept of permanence of objects. He then attempts to retrieve an object that disappears from his range of action.

The second characteristic of coordinated space is integrated with the formation of the object concept. The spatial world at first is totally uncoordinated. By the end of 2 years, the child develops the concept which is characterized by relationship among objects and between objects and his own body.

The infant does not have any real sense of duration at the beginning of life. By the middle of first year of life, a rudimentary sense of duration is present, but it is entirely a subjective phenomenon. By the end of the first year, the infant is entirely a subjective phenomenon. By the end of the first year, the infant frees himself from this personal concept of time, and the beginning of objective existence of time takes place.

2. **The development of symbolic and preconceptual thought (2 to 4 years):** At the end of the sensorimotor period, the child starts dealing with the world by means of ideational representations. By imitation and other forms of behaviour, he demonstrates that he is capable of extending his world beyond here and now. These actions of the child indicate the use of symbols. By the age of 4 years the child develops way of representing the environment in the absence of perceptual cues and will build a set of symbolic schemes.
3. **The period of intuitive thought (4 to 8 years):** At this stage, the child is able to use concepts as stable generalization of past and present experiences. His reasoning is not logical and is based on intuition rather than on systematic logic. The intuitive thought of the child is mainly concerned with stages or static configurations and neglects transformation. The child talks about this or that momentary static conditions but he cannot adequately link a whole set of successive conditions into an integrated totality by taking into account the transformations which unify them and render them logically coherent.
4. **The period of concrete operations (8 to 12 years):** Concrete operation means that stage of cognitive development when the child is able to direct his attention away from the static conditions and can focus on the whole set of successive changes that occur in the process of transformation. At this stage, the child can reason well. Transformation could return to its starting point. Piaget has given a long list of operations which make possible the handling of numbers in various relations to each other, the arrangement of objects into classes and sub-classes and the ordering of objects according to one or more attributes. He has coined a term 'grouping' to describe a set of operations.
5. **The period of formal operations (from 12 years to adolescence):** At this stage, the child's thought process becomes quite systematic and reasonably well-integrated. These qualities of the child's thought process are evident when events are present. Reality guides his contemplation of possibility. He starts a

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form of hypothetico-deductive reasoning. The use of formal operations is what is called the controlling aspects of comprehending.

The child at this stage in his formal thinking can free himself of the here and now in a lawful and systematic way. His wisdom lies in the masterful administration of the unforeseen. When an adolescent is faced with a problem, he uses formal operations to identify the variables that seem relevant to the solutions, and then considers all the possible combinations of these variables.

5.3.4 Thorndike's Theory of Intelligence

On the basis of trial and error learning, Thorndike propounded some laws of learning.

The law of readiness

Readiness includes all those preparatory adjustments which immediately precedes the action. Reminding the learner of his past experience, mental preparation for the understanding of new things, diverting his attention towards the subject to be learned, the altering of the environment to suit the learning are all included in learning. This readiness creates a desire for learning and thus the learner's mental attitude towards learning.

According to Thorndike: 'When any conduction unit is ready to conduct for it to do so is satisfying. When any condition unit is not in readiness to conduct for it to conduct is annoying. When any condition unit is in readiness to conduct, for it not to do so is annoying.'

The law of readiness states that if the learner is in a state of readiness, which means he is prepared for learning, then the process of learning will be fast and it will be retained for a longer period of time. Thus, readiness means a mental preparation for action. It is the preparatory development or physiological growth. We progress in the process of learning by the motivation furnished by our wants, interests and attitudes. A person cannot perform an activity with ease towards which he is unfavourably dispensed.

The law of effect

Thus, the simple meaning of this law is responses to a situation which are followed by a rewarding state of affairs will be strengthened and become habitual responses to that situation. So when the learner is satisfied and is happy with the learning then he will remember that for a longer period of time than a situation when the learner is not happy and is dissatisfied. If there are some unpleasant experiences associated with learning then the learner will like to forget and ultimately learning will not be effective.

Law of multiple response or varied reactions

The law states that when an individual comes across a situation he acts in a number of ways before arriving at a correct response. A person tries to solve a new problem by diversified responses in behaviour which guide him in attaining success and make learning possible. Thus, the learner reaches the solution by making variations in the responses. If a person keeps on working towards the solution of a problem in a particular manner only and does not change the approach in the case of failure also, then the person will not learn anything. The person who is learning should constantly change his style until he achieves success.

Law of attitude

Learning is conditioned by the attitudes and mental set of the learner. The response of a person in a specific situation is dependent upon his permanent adjustment in a particular setting like culture. For example, an Indian child will touch the feet and give respect to elders while an American child will not have the same gesture of respecting the elders. The response depends upon the cultural learning. The mental set decides not only the response but also the object from which a person will derive satisfaction or dissatisfaction. A bright student is not satisfied when he or she scores less marks, but an average student may have satisfaction by scoring the same marks. Learning takes place just because of attitude. If the learner has the positive attitude towards the task then learning will be better.

Law of analogy

An individual responds to a new situation on the basis of the responses by comparison or analogy. It is also called the 'law of assimilation'. The response from an individual will be similar to the one in which he has behaved previously.

Law of associative shifting

This law indicates that the position of the responses of the learner shifts. This shifting is done in respect of the basic stimulus or some related associative stimulus. For example, a dog starts salivating when he sees food and approaches the bearer with his wagging tail. The result of constant repetition of this phenomenon is that the dog wags his tail on the mere perception of the man and the shape of the dish. Thus, the response originally directed to the food is now shifted to the man and the dish because both these objects are associates of the main stimulus, the food, and we conclude that associative shifting in the response has taken place.

Law of exercise: The law of exercise is divided into two subparts, law of use and law of disuse.

- **Law of use:** According to this law, repeated application of an activity fixes it firmly in the mind. Repetitive application of the activity results in the formation of a habit in the muscles and the nerve fibres of the brain so that there is a facility in its execution in time of need.
- **Law of disuse:** According to Thorndike, 'when a modifiable connection is not made between a situation and response during a length of time that connection's strength is decreased all other things being equal.'

5.4 EMOTIONAL INTELLIGENCE AND MULTIPLE INTELLIGENCE

In this section, we will discuss the concepts of emotional intelligence and multiple intelligence in detail.

5.4.1 Emotional Intelligence

Peter Salovey, professor and psychologist at Yale University and John Mayer, professor and psychologist at the University of New Hampshire were one of the first people to coin the term 'emotional intelligence (EI)'. In 1995, Daniel Goleman, the leading expert

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Check Your Progress

1. Why is Spearman's theory also known as 'electric theory' or 'anarchic theory'?
2. What is 'law of assimilation'?
3. Name the two subparts of 'law of exercise'.
4. What does the 'law of readiness' state?

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in this field, reported 'IQ is only a minor predictor of success in life, while emotional and social skills are far better predictors of success and well-being than academic intelligence'.

Emotional intelligence is said to be of even greater importance than traditional IQ in learning. It is said that the emotional center of the brain has links with our long-term memory. Today it is even recommended that if learning is enhanced by emotional involvement it can fuel commitment and awaken curiosity. Emotional intelligence and its nurturing is important as they are said to facilitate the understanding of oneself and the emotional states of others. Today, emotion based learning is said to be as important as cognitive learning.

According to Goleman's work, children's emotional and social skills can be cultivated. This will lead to success in his social and personal life. He speaks of the following five crucial emotional competencies basic to social and emotional learning:

1. **Self and other awareness:** Understanding and identifying feelings; knowing when one's feelings shift; understanding the difference between thinking, feeling and acting; and understanding that one's actions have consequences in terms of others' feelings.
2. **Mood management:** Handling and managing difficult feelings; controlling impulses; and handling anger constructively.
3. **Self-motivation:** Being able to set goals and persevere towards them with optimism and hope, even in the face of setbacks.
4. **Empathy:** Being able to put yourself 'in someone else's shoes' both cognitively and affectively; being able to take someone's perspective; being able to show that you care.
5. **Management of relationships:** Making friends, handling friendships; resolving conflicts; cooperating; collaborative learning and other social skills.

The mastery of these five competencies results in the enhanced emotional intelligence.

Individual differences in distribution of intelligence

It is generally agreed upon by almost all psychologists that intelligence increases up to adolescence and declines in old age. These are general trends, but little is known with sufficient certainty to be widely accepted. The technical and theoretical difficulties in obtaining a reliable curve of growth and decline of intelligence, are two. One that intelligence at 5 years of age is very different from intelligence at the age of 15 or 25 years and that appropriate tests for different age groups can only said to be comparable in a rather general way. Second difficulty is that cross-sectional studies, that report the result of different age groups tested at one time, often produce results that differ markedly from those of longitudinal or follow-up studies, in which the same individuals are tested at successive stages.

This later difficulty is particularly evident if one attempts to describe the general trend of intelligence through the whole life-span from childhood to old age. The extent to which intelligence in old age declines is still an open question. Many studies have shown that a decline begins in the middle or late teens. Bayley (1955) has argued that, if appropriate tests were available, intelligence could be shown to increase up to the age of 50 years.

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Thorndike has pointed out that measures of gains are inherently unreliable, that they are typically almost unrelated to the initial score, that the required assumption of equal units of measurement is rarely met and that there are particular dangers in correlating initial IQ and gain in IQ.

The most thorough and famous cross-sectional study that was designed to plot the trend of intelligence through adult life was that of Jones and Conrad in 1933. They administered Army Alpha to 12,000 subjects ranging from 10 to 60 years of age.

5.4.2 Gardner's Theory of Multiple Intelligence

The theory of multiple intelligence was developed by Howard Gardner Professor of Education at Harvard University. It suggests that the traditional notion of intelligence based on IQ testing is very limited.

Howard Gardner was the first to see the limits of the old way of thinking about intelligence. In his book *Frames of Mind* published in 1983, he proposed that there was not one, monolithic kind of intelligence, that was crucial for success, but rather a wide spectrum of intelligences with seven key varieties. His list includes two standard academic kinds, i.e., 'verbal' and 'mathematical logical alacrity'; it also includes 'spatial capacity' often seen in an outstanding artist or architect; the 'kinesthetic genius' displayed in physical fluidity; the 'musical or rhythmical'; the 'personal intelligences'; 'interpersonal skills' and 'intrapyschic capacity.'

Gardner acknowledges that seven is an arbitrary figure. For the variety of intelligences, there is no magic number to the multiplicity of human talents. At one point of time, Gardner had given 20 different varieties of intelligence. Interpersonal intelligence broke down into four distinct abilities. i.e., leadership, the ability to nurture relationships and keep friends, the ability to resolve conflicts and the skill of social analysis.

Gardner's thinking about the multiplicity of intelligence continued to evolve. In 1993, he gave the summary of personal intelligences as follows:

'Interpersonal intelligence is the ability to understand other people: what motivates them, how they work, how to work cooperatively with them. Successful politicians, social workers, teachers, clinicians, religious leaders and sales people are individuals who have high interpersonal intelligence. Intrapersonal intelligence is a correlative ability, turned inward. It is the capacity to form an accurate, veridical model of oneself and to be able to use this model to operate effectively in life.'

According to Gardner, the core of interpersonal intelligence includes the 'capacity to recognize and respond appropriately to moods, temperaments, motivations and desires of other people'. In intrapersonal intelligence, he included 'access to one's own feelings and the ability to discriminate among them and draw upon them to guide behaviour.'

The theory of multiple intelligence has evolved to focus on meta cognition—that is, awareness of one's own mental processes—rather than on the full range of emotional abilities. Gardner pointed out that many people with IQ of 160 work for people with IQ of 100, if the former have poor interpersonal intelligence and the latter have a high one. The multifaceted view of intelligence offers a richer picture of child's ability and potential for success than standard IQ.

Check Your Progress

5. When was the book (*Frames of Mind*) of Howard Gardner published?
6. List some of the elements of the structure of intellect.
7. Why is emotional intelligence and its nurturing important?

5.5 MEASUREMENT OF INTELLIGENCE

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Intelligence tests are used to measure intelligence. It is important to note that intelligence is inferred from a variety of elements, i.e., behaviour and speed of doing things correctly, etc. for which intelligence tests have been devised. An intelligence test is an objective and a standardized measure.

Intelligence is measured through a complicated process. It involves a comparison and establishment of a relationship between C.A. (Chronological Age) and M.A. (Mental Age). This relationship is expressed by the term I.Q. (Intelligence Quotient). When the mental age is divided by the chronological age and the quotient is multiplied by 100, the result is I.Q.

$$I.Q. = \frac{M.A.}{C.A.} \times 100$$

When we want to calculate the mental age of a student all questions assigned to the age are put to him (In the individual scale of Binet a certain number of questions are assigned to that age). If he answers all the questions assigned to that age correctly, his mental age is equal to his chronological age and that child is considered to be an average one. Suppose you have to test a child of C.A. 8 on the Binet scale. You will start with questions assigned to the sixth year and then go up. The child may be successful in answering correctly all the questions assigned to years 6, 7, 8 and may stop at 9. His mental age will be 8.

Intelligence is measured on the following factors:

1. **Vocabulary**—Choosing a synonym or antonym or near-synonym or near-antonym.
2. **Verbal analogies**—e.g., Branch is to a tree as brook is to river.
3. **Sentence completion**—e.g., India has—states.
4. **Arithmetic reasoning**—Simple arithmetic sums.
5. **Number series**—For example, what next? 11, 13, 15 (17, 19, 21).
6. **Picture arrangement**—Arranging disarranged pictures of a story in proper sequence.
7. **Comprehension**—For testing commonsense, certain cards or paras are given in which some absurdity is shown.
8. **Similarities**, e.g., In what way cotton and silk are alike?
9. **General information**—from everyday life.
10. **Digit span**—For testing memory, digits are spoken and the subject is asked to repeat them in the same order.
11. **Digit-Symbol substitution**—A code is given and substitution is to be done.
12. **Figure analogies**
13. **Classification**—e.g., which word on the right belongs to the group on the left? Pen, table, book, stone, pencil, radio
14. **Multimental**—e.g., which one of the figures does not belong to the other four.

Development of Mental Tests

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Are all persons equally intelligent? Are all the students fit for school instruction? Are all students capable of pursuing the same courses? Are all students fit for all occupations? Is it proper to educate all students in the same way?

These and various such questions have been engaging the attention of the psychologists for the past hundred years or so. Many attempts have been made to measure intelligence possessed by individuals so that necessary arrangements may be made to give them training according to their intelligence. Thanks to the ceaseless efforts of various psychologists whose standardized tests are available which can be used to measure intelligence.

Anne Anastasi observes: 'Psychological testing is a relatively young branch of one of the youngest of the sciences.'

Pre-Binet Position

One of the first problems, which stimulated the development of psychological tests, was the identification of the feeble-minded. French physician

Escurioi was the first person to write a two-volume work in 1828 in which over one hundred pages were devoted to feeble-mindedness.

Another French physician who made a valuable contribution was Seguin who in 1837 established the first school devoted to the education of mentally defective children. In 1848, he migrated to America where his ideas gained recognition.

The general aim of the early experimental psychologists of the nineteenth century was the formulation of generalized descriptions of human behaviour and not the measurement of individual differences. Many of the early experimental psychologists received their training in a laboratory founded by Wundt at Leipzig in 1879.

Sir Francis Galton, an English biologist, was primarily responsible for launching the testing movement on its course. In 1882, an anthropometric laboratory, was established by him in South Kensington Museum, London. In this laboratory individuals could be measured in certain physical traits by the payment of a small fee. Galton himself devised most of the simple tests. Galton also paved the way for the application of rating scale and questionnaire methods, etc. One of his disciples, Karl Pearson carried forward his work.

James McKeen Cattell of America occupies a prominent position in the development of psychological testing. He used the term "mental test" in an article in 1890. This article related to a series of tests which were being administered annually to college students in the efforts to determine their intellectual level. Cattell like Galton felt that a measure of intellectual functions could be obtained through tests of sensory discrimination and reaction time.

Among others the names of Jastrow, Krae Pelin and Ferrai may also be mentioned.

Binet-Simon Test

The father of intelligence testing is Alfred Binet, a French educator. Binet disagreed with some of his contemporaries who tried to measure general intelligence by testing reaction time, rote memory, sensory activity, or muscular movements. According to

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him, intelligence could be estimated, only by test of higher faculties like reasoning, comprehension, judgement, adaptability. Persistence, and self-criticism. Binet worked on these lines and in collaboration with Theophile Simon, published the first intelligence test in 1905. This test had 30 items arranged in order of increasing difficulty. It took about 15 years to complete the test.

Binet tried out these items on children and in 1908, brought out a revised scale which divided the test items into age groups from 3 to 11 years. At some age levels, only 3 questions were asked, at others 5 or 6. With this scale, Binet introduced the concept of mental age. If a child's (whose chronological age is 8) score on a test is equal to the average score of children of 9 years of age, then his mental age will be nine in spite of the fact that his chronological age is eight.

In 1911, shortly before his death, Binet published a second revision of his scale. It omitted some old items and introduced some new ones. He also brought the scale up to adult level. In this revision, he included 5 tests for each age except the 4-year level.

Revised Test of 1916

The first serious revision of Binet-Simon Scales was prepared by Terman at Stanford University and was published in 1916. This revision introduced great many alternatives and new additions. The entire scale was restandardized on an American Sample of about 1,000 children and 400 adults. For the first time the term I.Q. or "intelligence quotient" was introduced. I.Q. has been defined as the ratio of Mental age to Chronological age. To avoid fraction, it is multiplied by 100. Thus:

$$I.Q. = \frac{\text{Mental Age}}{\text{Chronological Age}} \times 100$$

$$\text{or simply } I.Q. = \frac{M.A.}{C.A.} \times 100$$

In the 1916 revision, the number of questions was 90.

1937 and 1960 Revisions

In 1937 and 1960, the Stanford University Test was revised by Merrill and Terman. It is also known as Stanford-Binet Individual Test of Intelligence. It contains 129 questions suitable for a child of 2 years, 2.5 years, 3 years, 3.5 years, 4 years, 4.5 years and then for 5, 6-14 years of ages. There are no questions for 5.5 as it is thought that there is not much difference in I.Q. of 5 years and 5.5 old child.

Wechsler Scales of 1939 and 1955

The 1937 Stanford-Binet Scale, in spite of its merits was not considered particularly well-suited for adults. It was not standardized on any individual over 18 years of age in obtaining the I.Q. The Wechsler Scale was published in 1939 for this purpose. The scale was revised in 1955 and a new version Wechsler Adult Intelligence Scale (WAIS) came into existence. The age ranges are from 16 to 64 years.

The Scale comprises the following sub-tests which fall under two broad categories: (a) verbal tests and (b) non-verbal tests.

- **Verbal tests:** These contain the following types: (i) vocabulary, (ii) information, (iii) arithmetic items, (iv) comprehension, (v) similarities, and (vi) digit span.
- **Non-verbal tests:** These include (i) block design (ii) picture arrangement, (iii) object assembly, (iv) mazes, and (v) picture completion.

Comparison between Binet Test and Wechsler Scale

Binet	Wechsler
1. It is primarily for children.	1. Age ranges are from 16 to 64 years.
2. It is a mental age scale. Items are grouped in terms of mental age.	2. It is a point scale. Points are given for correct responses.
3. Selection is made by relation of success by age.	3. Selection is made by function measured.
4. Items are ungraded and unrelated.	4. Items are graded.
5. The test is inflexible.	5. The test is flexible.
6. It is qualitative in evaluation.	6. It is quantitative in evaluation.

Landmarks in the Development of Testing

	1826
Robert Owen's Rating Scale	1842
Seguin's Form Boards	1905
Binet-Simon Scale	1908
Goddard Translation of Binet's Scale	1909
Courtis Practice Test in Arithmetic	1910
Thorndike Handwriting Scale	1911
Healy and Fernald Performance Test	1912
Hillegas Composition Scale	1915
Buckingham Spelling Scale	1915
Yerkes Point Scale	1916
Stanford Revision of the Binet-Simon Scale	1917
Army Group Tests, Stenquist Assembly Tests	1919
Sea shore Tests of Musical Ability	1921
Rorschach Test	1927
Strong Vocational Interest Inventory	1933
Hildreth Readiness Test	1935
Murray Apperception Test	1937
Stanford-Binet Revision Scale	1938
Thurstone Primary Abilities Test	1937
Wechsler Scale	1955
Wechsler Adult Intelligence Scale	1960
Revised Version of Stanford Binet Test	

Classification of Intelligence Tests

These may be classified under three categories:

1. **Individual Tests**—These tests are administered to one individual at a time.

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These cover age group from 2 years to 18 years. These are: (a) The Binet-Simon Tests, (b) Revised Tests by Terman, (c) Mental Scholastic Tests of Burt and (d) Wechsler Test.

2. **Group Tests**—Group tests are administered to a group of people. Group tests had their birth in America—when the intelligence of the recruits who joined the army in the First World War was to be calculated. These are: (a) The Army Alpha and Beta Test, (b) Terman's Group Tests, (c) Otis Self-Administrative Tests. Among the group tests there are two types (i) Verbal and (ii) Non-Verbal. Verbal tests are those which require the use of language to answer the test items. Non-Verbal tests do not require the use of language to respond to the item.
3. **Performance Tests**—These tests are administered to the illiterate persons. These tests generally involve the construction of certain patterns or solving problems in terms of concrete material. Some of the famous tests are: (a) Kohs Block Design Test (b) The Cube Construction Tests, and (c) The Pass Along Tests.

Comparison of Individual Tests and Group Tests

Individual Test	Group Test
It is administered to an individual at a time.	It is administered to a group at the same time.
It is costly in terms of administration and time.	It is less costly in terms of administration and time.
A trained tester is required to administer it.	No trained person is required to administer it.
There is face-to-face interaction between the individual and the tester.	There is no such face-to-face interaction
Individual test is more reliable. Guidance can be provided to the individual on the basis of its results.	Group test may be influenced by several factors.
It is useful for small children.	It is suitable for older children and adults.
The tester can motivate the individual by means of praise and encouragement as he can adapt to the needs of the individual child.	It is not possible to do so.
There is very little scope for cheating.	Cheating, on a large-scale is possible.
There is no competition in individual testing.	Speed and reading ability may influence the test score.
No special formalities are observed in individual testing.	Several formalities are observed in administering.
Instructions can be made clear before testing.	A few members of the group may not clearly understand the instructions.

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Measuring Special Ability

The I.Q. obtained as a result of performance on an intelligent test indicates general status only. It does not point to the size of strength or weakness in each of the particular mental abilities that are being measured. For example, two students showing an I.Q. of 120 on a particular test may have different positions on different sub-tests; one may do very well on arithmetic and poorly on vocabulary, while the other may do well on vocabulary and poorly on arithmetic; yet both score the same total.

Primary Mental Abilities Test (PMA Test)

To correct this sort of error we need tests which indicate differential success of a subject on various mental abilities. The tests of primary mental abilities prepared by Thurstone meet this need. The PMA test for ages 11 to 17 is based on the group factor theory of mental ability which postulates that intelligence is made up of certain distinct and more or less independent mental functions which Thurstone called the primary mental abilities.

The primary abilities as measured by this test are as follows:

1. Number facility
2. Verbal comprehension
3. Spatial perception
4. Word fluency
5. Reasoning
6. Rote memory

Differential Aptitude Test Battery (DATB)

Another test to measure the special abilities is Differential Aptitude Test Battery (DAT). This comprises eight tests:

1. Verbal Reasoning
2. Numerical Ability
3. Abstract Reasoning
4. Space Relations
5. Mechanical Reasoning
6. Clerical Speed and Accuracy
7. Language Usage: Spelling
8. Language Usage: Grammar, punctuation and word usage

General Aptitude Test Battery (GATB)

Another test of the differential aptitude type is the General Aptitude Test Battery (GATB), developed by the United States Employment Service. It consists of 15 tests which cover 9 factors, such as intelligence, verbal aptitude, numerical aptitude, spatial aptitude, form perception, clerical perception, motor-coordination, finger dexterity and manual dexterity.

These sophisticated test batteries mentioned above give a much more clear picture of, what special abilities a person has than the general intelligence tests.

Use of Intelligence Tests

Some of the important areas in which intelligence tests may be employed are given here:

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- I. **Selection of Students to a School:** In good schools there is always rush for admission. All the applicants though eligible for admission cannot be admitted. Intelligence tests help to meet out this difficulty.
- II. **Classification of Pupils:** Intelligence Tests help us to make a sifting at the time of first admission to school at the age of five or six. Secondary education is the next stage where another check can be provided.
- III. **Detection of Superior and Inferior Intelligence:** Some pupils have very superior intelligence while others not. They move at different rates. All these cannot be given instruction together. Many methods have been suggested to give instruction to the superior and the gifted. Some favour complete segregation of the gifted and the superior, while others suggest that they should be taught along with the average and an enriched course of study should be prescribed for them. To quote Prof. R R. Kumria, "If on the other hand gems of purest ray serene' are allowed to be unfathomable caves, the blame of this criminal neglect lies at the door of the parents and teachers who are making the future generation—they should pick and choose the vanguard and the rearguard of the nation. Tarring all with the same brush is not only a psychological absurdity but a political blunder."

Dr. Rice's classification of the Intelligence Quotient of the Indians is as under:

Classification	Punjabi I. Q.
Genius	165 and up
Very superior	140-165
Superior	120-140
Average	85-120
Dull	70-85
Borderline	55-70
Feeble-minded	Below 55

- IV. **Selection of Courses:** Different subjects require different degrees of intelligence. Some call for a higher order of intelligence and the others of a low. A nation-wide study conducted in the United States gave the following Median I.Q. of the High School boys in different courses:

Courses	Median I.Q.
Technical	114
Scientific	108
Academic	106
Commerce	104
Trade	92

Burt found the following correlation between:
Intelligence and composition

Intelligence and reading	...	...	.56
Intelligence and arithmetic (Problems)	...	...	.55
Intelligence and spelling	...	...	.52
Intelligence and writing	...	...	.21
Intelligence and hand work	...	...	.18
Intelligence and drawing	...	...	.15

- V. **Selection of Suitable Occupations:** Burt draws up the following provisional scheme for occupational classification according to the degree of intelligence they require:

Higher professional and administrative work—(I.Q. 150)—lawyer, physician, architect, teacher (University and Secondary).

Lower professional, technical and executive work—(I.Q. 130 to 150).

Clerical and highly skilled work (I.Q. 115 to 130)—Shorthand typist, bank clerk, salesman, electrician, nurse.

Skilled Work (I.Q. 100 to 115)—Tailor, dressmaker, carpenter, cashier, printer.

Semi-skilled repetition work (I.Q. 85 to 100)—Barber, welder, minor, painter, baker.

Unskilled repetition work (I.Q. 70 to 85)—Manual labour, navy groom, packer.

Casual Labour (I.Q. 50 to 70)—Simplest routine work

Institutional—Under 50—Unemployable

- VI. **Award of Scholarships:** Various public scholarships are awarded on the basis of the results secured through intelligence tests.

- VII. **Determination of the Optimum Level of Work:** The intelligence tests help to measure the student's capacity to succeed in his school work and enable the teachers to make an estimate of the mental level at which the student can be expected to work most efficiently in academic subjects. I.Q. is a rough index of the probable learning capacity of the various members of the class. With the aid of this test the teacher finds it easy to adjust his methods to meet the needs of the individual.

- VIII. **Assessment of Teacher's Work:** When the achievement of the pupils in a subject does not correspond to the scores of intelligence tests, it gives indication that the subject has not been properly taught by the teacher and properly understood by the student.

- IX. **Discovery of Unusual Cases:** The lack of intelligence may be the main cause of abnormal behaviour. The intelligence tests help to find other cases of abnormal behaviour.

- X. **Intelligence and Success in College:** Gates and others think that an I.Q. of at least 120 is needed to do acceptable college work in a first college with an average expenditure of time and energy.

- XI. **Help in Diagnosis of Backwardness:** Ordinary scholastic examinations fail to discover 'educable abilities'. The failure of a child in the examination is no indication that he lacks intelligence. This failure may be due to defective methods of teaching or it may be due to some temperamental or physical obstacles which might have stood in the way of the child. There may not be any fault with the intelligence of the child, only it has not been allowed to work itself out.

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XII. Evaluation of Methods and Materials of Instruction: Intelligence tests are helpful in evaluating the results of the experiments conducted by a school in the relative importance of the different methods of instruction, i.e. achievement obtained with different textbooks or with a certain textbook as contrasted with extensive reading material not confined to any one book.

Limitations of the Intelligence Tests

It would be a great mistake to think that these tests are all in all. Intelligence is not the only factor which determines the equipment of a man for the journey of life.

The first limitation of such tests is that they seek to measure intelligence which in itself is not a clear conception to the psychologists and about which they differ among themselves

Secondly, intelligence is not the only factor which plays a significant role in the success or failure of a man in a particular vocation. The intelligence tests fail to measure the depth, strength and qualities of a man per-training to his emotional stability. They also fail to measure his ethical, social and aesthetic qualities which play a significant part in the life of an individual.

Thirdly, intelligence tests fail to take into account the environmental factors and the educational factors many a time and thus give misleading results. These tests may include material with which children of certain socio-economic groups have had more experience than those of other groups.

Precautions to be Taken

While interpreting test results, the teacher, however, should take certain precautions namely:

1. General intelligence test, especially the group test measures ability to work with abstract ideas and their relationships. This is just one type of ability. Thus a child who scores low on this test can do well or very well on other practical activities. Children with low intelligence should therefore be encouraged to develop and strengthen their special practical skills.
2. Verbal group test of intelligence is sufficiently dependent upon reading. So a low test score should be interpreted very carefully for a poor reader. Such a child should be tested on an individual test as well as on a non-verbal test.
3. Intelligence test results for socially disadvantaged children should be interpreted with caution.
4. The test interpreter should always keep in mind the standard error of measurement and give due allowance for it.
5. Intelligence tests leave untouched many important aspects such as interests, attitudes and motives, etc.

ACTIVITY

Visit a public library and write a short note on intelligence testing in Indian education system.

Check Your Progress

8. State any two characteristics of group tests.
9. List some uses of intelligence tests.

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DID YOU KNOW

Thurstone applied the law of comparative judgment in psychophysics, and later to the measurement of psychological values.

5.6 SUMMARY

In this unit, you have learnt that:

- Comprehension, invention, direction and censorship: intelligence lies in these four words.
- E.L. Thorndike defined intelligence in terms of three somewhat independent dimensions: (i) attitude, (ii) breadth, and (iii) speed.
- In ancient India, intelligence was measured through conversation, physical features, gestures, gait, speech, changes in the eye and facial expression.
- An intelligent person has the ability to adjust himself to the changing circumstances with ease, efficiency and speed. He has the capacity to assimilate ideas very quickly and clearly. He can cope with new situations very successfully.
- Logical-mathematical intelligence is the ability to calculate, quantify, consider propositions and hypotheses, and carry out complete mathematical operations.
- Intra-personal intelligence is the capacity to understand oneself and one's thoughts and feelings, and to use such knowledge in planning and directioning one's life.
- Guilford conceives of intellectual functioning as having three dimensions: (i) operations, (ii) content and (iii) products. *Operations* are processes involved in intellectual behaviour-cognition. memory, divergent thinking, convergent thinking and evaluation. The *con-tent* of these operations may be figural, symbolic, e.g., letters, numbers, semantic e.g., words or behavioural e.g., information about other persons, behaviour, attitudes, needs, etc. The *products* may be—units, classes, relations, systems, transformations and implications.
- The SI model has explored 150 intellectual abilities and this enables us to find out if we are paying adequate attention to each of these. If not, it explains how to improve.
- Piaget believed that schemas (cognitive structures) exist in primitive form at conception and progressively develop during the lifetime in certain systematic ways. According to him, cognitive structures contain all the necessary energy for their emergence and development without requiring some motivating force.
- Emotional intelligence and its nurturing is important as they are said to facilitate the understanding of oneself and the emotional states of others. Today, emotion based learning is said to be as important as cognitive learning.
- The theory of multiple intelligence has evolved to focus on meta cognition—that is, awareness of one's own mental processes—rather than on the full range of emotional abilities.

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- Intelligence is measured through a complicated process. It involves a comparison and establishment of a relationship between C.A. (Chronological Age) and M.A. (Mental Age). This relationship is expressed by the term I.Q. (Intelligence Quotient). When the mental age is divided by the chronological age and the quotient is multiplied by 100, the result is I.Q.
- Verbal group test of intelligence is sufficiently dependent upon reading. So a low test score should be interpreted very carefully for a poor reader. Such a child should be tested on an individual test as well as on a non-verbal test.

5.7 KEY TERMS

- **Cognition:** It is the mental process of knowing, including aspects such as awareness, perception, reasoning and judgment.
- **Empathy:** It is the capacity to recognize and, to some extent, share feelings that are being experienced by another semi-sentient being.
- **Test:** It is an attempt to learn or prove what something is like or how it will act by studying or doing.
- **Readiness:** Includes all those preparatory adjustments which immediately precedes the action.

5.8 ANSWERS TO 'CHECK YOUR PROGRESS'

1. Spearman's theory is also known as the "*electic theory*" because it harmonizes elements from all the main types. Thurstone's theory is also known as the "*anarchic theory*", because he conceives of mind as consisting of a number of independent facilities.
2. An individual responds to a new situation on the basis of the responses by comparison or analogy. It is also called the 'law of assimilation'.
3. The law of exercise is divided into two subparts, (i) law of use and (ii) law of disuse.
4. The law of readiness states that if the learner is in a state of readiness, which means he is prepared for learning, then the process of learning will be fast and it will be retained for a longer period of time. Thus, readiness means a mental preparation for action. It is the preparatory development or physiological growth. We progress in the process of learning by the motivation furnished by our wants, interests and attitudes. A person cannot perform an activity with ease towards which he is unfavourably dispensed.
5. The book, *Frames of Mind*, of Howard Gardner was published in 1983.
6. Some of the elements of the structure of intellect include: cognition, memory, divergent thinking, convergent thinking, and evaluation.
7. Emotional intelligence and its nurturing are important as they are said to facilitate the understanding of oneself and the emotional states of others.

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8. Two characteristics of group tests are as follows:
 - In all group tests, the items are placed together in separate sub-tests or parts, beginning with the easier and progressing by intervals to the most difficult.
 - Every group test is standardized for a special range of ages or school grades.
9. The intelligence tests are used for measuring general learning readiness; for indicating the extent of differences of IQ among the children of same chronological age; defining more accurately the degree of mental retardation or defect; for identifying gifted children; for educational and vocational guidance; for study of mental growth and for use in research.

5.9 QUESTIONS AND EXERCISES

Short-Type Questions

1. What are the different types of intelligence?
2. Define 'multiple intelligence'.
3. Write a short note on Thurstone's theory of intelligence.
4. What are the educational implications of the SI model?
5. What are the advantages of the intelligence tests?

Long-Type Questions

1. Describe Gardner's theory of multiple intelligence.
2. Write a detailed note on emotional intelligence.
3. Give a detailed account on the Piaget's theory of intelligence.
4. Draw a comparison between Binet Test and Weschsler Test of Intelligence.
5. Explain the concept of intelligence tests and what are they used for.

5.10 FURTHER READING

- Eysenck, H. J.; *Personality, Genetics and Behavior*, Praeger, New York, 1982.
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- Hall & Lindzey (eds), *Theories of Personality*, Longman's Publication, Chennai
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UNIT 6 PERSONALITY AND MENTAL HEALTH

NOTES

Structure

- 6.0 Introduction
- 6.1 Unit Objectives
- 6.2 Meaning, Nature and Determinants of Personality
 - 6.2.1 Development of Personality
 - 6.2.2 Genetic and Cultural Factors of Personality
- 6.3 Theories of personalityTheories of personality
 - 6.3.1 Type Theories
 - 6.3.2 Trait Theory
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- 6.6 Maladjustment
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- 6.7 Inclusive Education
- 6.8 Summary
- 6.9 Key Terms
- 6.10 Answers to 'Check Your Progress'
- 6.11 Questions and Exercises
- 6.12 Further Reading

6.0 INTRODUCTION

Personality is a concept that we use continuously in our day-to-day routine when dealing with people. We talk about people as having a good personality or a bad personality or arrogant and aggressive personality. Sometimes we refer to disagreements among people as being due to personality conflicts.

Personality can be reflected in a person's temperament and is a key factor influencing individual behaviour in organizations. Often the wrong type of personality of a superior proves disastrous in terms of worker unrest and protests. Sometimes the personality difficulties are the root cause of labour strikes. No matter how good the superior is in technical knowledge or other behavioural characteristics, it is the "temperament" of the superior that is crucial in cordial interaction with subordinates.

Mental health refers to the level of cognitive or emotional well-being of a person. It also depicts the absence of a mental disorder. From viewpoints of the discipline of positive psychology, mental health may encompass an individual's capability to enjoy life and acquire a balance between life activities and efforts to attain psychological spirit. Mental health is an expression of a person's emotions and signifies a victorious adaptation to a range of demands.

In this unit, we will discuss the concept of personality and its various aspects, some of the personality theories, mental health and inclusive education in detail.

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6.1 UNIT OBJECTIVES

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

- Explain the concept of personality as a reflection of individualistic characteristics
- Discuss the nature of factors contributing toward formation of personality
- Describe the various dimensions of personality
- Differentiate between introvert and extrovert personalities
- Analyse personality as a reflection of inborn traits
- Explain personality on the basis of various theories—psychoanalytical theory, self-concept theory and social learning theory
- Describe the concept of mental health
- Explain the concept of inclusive education

6.2 MEANING, NATURE AND DETERMINANTS OF PERSONALITY

The meaning and definition of any term is arbitrary. This also holds true in case of the word personality. To arrive at its meaning, we have to trace the historical root of the word. The term personality has been derived from the Latin word '*Persona*' that was associated with Greek theatre in ancient times. *Persona* meant a mask, which the Greek actors commonly used to wear when they worked on the stage. In our own country, actors in Ram Lila and Krishna Lila use masks when they enact the role of a particular character from the epics.

The mask, worn by the actors, was called a persona. According to the concept of mask, personality was thought to be the effect and influence that the individual wearing a mask left on the audience. Even today, for a layman, personality means the effect that an individual leaves on other people. Precisely, we can say that the mask or persona of the actor implied a cover for the real person behind it. It was developed on the basis of Plato's idealistic philosophy who believed that personality is a mere facade for some substance.

1. **Personality as a stimulus:** Some psychologists define personality in terms of its social stimulus value. How an individual affects other persons with whom he/she comes in contact, whether he/she is impressive or repulsive, whether he/she has a dominating or a submissive personality. Personality, from this point of view, becomes identical to reputation and impression, mostly in terms of physical appearance, clothing, conversation and etiquette. Generally, we use this concept of personality in selecting applicants for various jobs and courses. The interviewers take into consideration the total picture of an individual's organized behaviour.

2. **Summative approach:** The second approach of defining personality emphasizes the importance of sum total of different processes and activities of the individuals as, for example, innate dispositions, habits, impulses, emotions, etc. This approach was criticized by Gestalt psychologists who objected to the idea of aggregation or sum total of parts without introducing the concept of organization and integration of parts into a total whole.

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3. **Integrative approach:** The definitions of this category lay emphasis on the integrative aspects of personality and its definite pattern of organization. Warren's dictionary defines personality as, 'personality is the integrative organization of all the cognitive, affective and physical characteristics of an individual as it manifests itself in focal distinction from others.' G.W. Hartman defined it as, 'personality is integrated organization of all the pervasive characteristics of an individual as it manifests itself in focal distinctiveness from other.'

4. **Totality view:** This approach to define personality puts more emphasis on integration than the first category of definitions given above. It forgets the part. According to this view, the general characterization or pattern of an individual's total behaviour is his personality. A man's personality is the total picture of his organized behaviour, especially, as it can be characterized by his fellowmen in a consistent way. Mark Sherman in his book *Personality: Inquiry and Application* (1979) has defined personality as, 'the characteristic pattern of behaviour, cognitions and emotions which may be experienced by the individual and/or manifest to others.'

5. **Personality as adjustment:** An individual, since his birth, attempts to adjust to his environment. The behaviour of an individual can be defined as an adjustment to his environment. Every individual develops his own unique way of adjustment in the society. According to this approach, personality is an individual's characteristic pattern of behaviour. An individual, through his continuous reactions, attempts to adjust himself in his/her environment. We can say that the sum of the individual's movements as he/she adapts himself to the environment is his personality.

We have described the various approaches to define the term personality. We now examine the important definitions of personality. Fredenburgh, in his book, *The Psychology of Personality and Adjustment*, tried to summarize the various definitions in a single definition, which is,

'Personality is a stable system of complex characteristics by which the life pattern of the individual may be identified.'

Allport (1961) who devoted most of his time for research on personality defines, 'Personality is the dynamic organization within the individual of those psychophysical systems that determine his unique adjustment to his environment.' The definition given by Allport is very comprehensive and includes all aspects of an individual's personality. Some terms used in the definition need explanation. A dynamic personality is one that is undergoing constant changes but is still organized. It constitutes two types of systems, i.e., psycho (mental) and physical and these two systems interact with internal and external environment. The word 'determine' emphasizes that it is the psychophysical system that activates the organism for action.

The unique adjustment of the individual to his environment means that each individual employs different methods of adjustment resulting in unique adjustment. Guilford (1959) defines personality as 'an individual's personality, then, is his unique pattern of traits. A trait is any distinguishable, relatively enduring way in which one individual differs from another.'

Thus, we see that different approaches have been taken to define personality but there is no agreement on a single definition of personality. Though there is diversity of views but even then all psychologists agree on certain common basic characteristics. One basic fact is that personality is unique. No two individuals, even identical twins,

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have the same personality. The second basic fact regarding personality is that it is the product of its own functioning. What we do today depends on our accumulated experiences of the past. The experiences are accumulated daily and shape our personality by a continuous interaction with the external environment. The third common characteristic of most definitions is that they stress on the need to understand the meaning of individual differences. Personality is what makes an individual unique. It is only through the study of personality that the relevant differences among individuals can be made clear.

6.2.1 Development of Personality

According to Allport, personality development is related to the concept of self or propium. It includes all the aspects of personality that make for internal unity. The propium develops through conditioning, reinforcement, habits and other aspects of learning. Allport outlines the following stages of the development of propium or self or personality:

1. **Bodily self (Birth to first year):** During infancy, sensations provide the anchor. It is the feelings or awareness of one's own body.
2. **Self-identity:** After about 18 months, the child is capable of recognizing himself/herself as a distinct 'person' and not merely a 'body'. He is aware of his likes and dislikes and his relationship with others in the immediate surroundings. The continuity of experience is made possible through the development of language.
3. **Self-esteem (2 – 3 years):** From second through third year of life emerges a sense of autonomy. The child is no more dependent on parents and experiences pleasure (pride) over his accomplishments and humiliation over his failure. He also develops negativism, i.e., refusal to obey or receive orders from others. This results in the development of self-esteem.
4. **Self-extension (4 – 6 years):** The child meets people and develops new interests and habits and develops self-image. He develops conscience. He learns to confirm to the expectations of others. The child develops good and naughty selves. He is sensitive to praise and reprimand.
5. **Self as a rational coper (6 – 12 years):** The individual develops reasoning power and uses problem-solving approach. Allport calls this rational coper.
6. **Propriate strivings (12 years – Adolescence):** As the child reaches adolescence, he is able to distinguish between peripheral and propiate motives. Peripheral motives include impulses, drives and striving for immediate gratification of needs. Fulfilment of peripheral motives reduces tension. Propiate motives are our efforts to increase tension rather than to reduce it. The individual strives for important goals in life. The conversion of peripheral motives to propiate motives is called 'functional autonomy'.
7. **Self as knower:** It includes all the previous aspects of the propium.

According to Allport, traits differ in intensity and magnitude in general population from individual to individual. No two individuals are alike in their behaviour. They operate in their unique way in the environment. Each individual is unique in his adjustment to the world around.

6.2.2 Genetic and Cultural Factors of Personality

Genetic

Let us first explain the meaning of the term heredity. Heredity is of two types: *biological heredity*, which the child inherits from his forefathers in the form of chromosomes and second is *social heredity*, which means all that one generation gets from preceding generations in the form of social traditions, customs and skills, etc. Each generation transmits the acquired skills and knowledge to the succeeding generations.

Principles of Heredity

Even a layman knows that a cat gives birth to kittens, lions have cubs and human beings have babies. Children generally resemble their parents or relatives. But we also find that in many cases children do not resemble their parents. There are numerous instances where intelligent parents have dull children or handsome parents have not-so-handsome children. This variation is universal in nature and is called the principle of variability of inheritance. There are two principles: one is of resemblance and the other of variability.

Genetic Material

We know that a tiny seed carries within itself all the elements from which there will emerge a full grown tree. In the same way, germ cells carry all the characteristics of a potential child. This is called the biological heredity of the child.

Mechanism of Heredity

When the human sperm and egg unite, the fertilized egg is called zygote. Each parent provides twenty three pairs of chromosomes, for the process of fertilization. The literal meaning of the term 'chromosome' is 'coloured body'. Every cell in the body contains the same number of chromosomes. The number of chromosomes in a cell is constant for a given species but varies widely from one species to another. All human cells have forty-six chromosomes; half of the chromosomes come from the mother and half from the father. Within the chromosomes, there are thousands of genes. These genes are the carriers of heredity characteristics from one generation to another. Genes are minute particles located in the chromosomes.

The Genetic Code

In the year 1962, the Nobel Prize winners discovered the structure of the material of heredity which throws new light on the traditional views of the composition of chromosomes. Chromosomes are made up of long organic molecules whose substance, deoxyribonucleic acid (DNA) is found in the chromosomes as two long strands periodically connected by chemical bonds.

The most constant feature of genetic material is the order of four basic compounds connecting the two strands of DNA. Our heredity information is not in the long strands of DNA but in their order of appearance between the two strands of DNA. The sex of the individual is determined by genes. One pair of chromosomes called concerned with the sex of the child. Women have two special sex chromosomes called X chromosomes. Men have an X and a longer Y. Thus we see that a male has both X and Y chromosomes while the female has only X chromosomes. If one of the X sperm unites with an egg, also carrying an X chromosome, then the child will be a girl. If a Y sperm meets an egg, the offspring will be a male child.

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Dominant and Recessive Traits

Genes, the carriers of human traits, are of two types; dominant and recessive. Genes occurring in paired positions along the chromosomes carry contributions toward the same characteristics but can give information of development. One gene may cause development of blue eyes while matched gene in the other chromosome may act to produce brown eyes. When both genes of the chromosomes act to foster identical characteristics in the offspring, this is said to represent the homozygous condition. If the information concerning a given characteristic differed in the paired gene position, the condition is called heterozygous. In many cases, one of the tendencies of the pairs of genes found in the heterozygous condition will dominate. Thus, when a child inherits a gene for blue eyes from one parent and a gene for brown eyes from the other, the child will have brown eyes. Therefore, we call the gene for brown eyes dominant.

Genetic Influences

Laws of Mendel: Gregor Mendel (1866) published the results of his continuous painstaking observation of cross-breeding of plants. He discovered the laws of inheritance in hybrid peas growing in the garden of an Austrian monastery. His principles of inheritance have been found applicable to plants and animals when the particular characteristic is determined by a single gene.

The Mendelian law of inheritance may be summarized as, 'If a man who is homozygous for blue eyes marries a woman homozygous for brown eyes, the children of this couple will have only brown eyes.' Now what happens if a heterozygous man marries a heterozygous woman? The distribution of children from this marriage will be such that one-fourth of them will be homozygous for brown eyes (*BB*); one-half of them will be heterozygous (*Bb*), and one-fourth will be homozygous for blue eyes (*bb*). Mendel's most valuable contribution is that all genetic information comes to the individual in units rather than in a graduated series. In other words, we receive from our ancestors genes controlling the development of specific unitary characteristics, not a mixture of various tendencies.

A second conclusion which may be drawn from the study of Mendel is that characteristics of men and animals tend to vary continuously along a dimension. As is the case with intelligence, we do not find a cluster of bright or dull people, but rather we find intelligence to be distributed in what appears to be a normal distribution among the population.

Cultural determinants

Every society is characterized by its cultural heritage which is transmitted from generation to generation in the form of social heredity. Indian society has a very rich cultural heritage and that could have a deep influence on children. Personality of an individual is gradually shaped by the culture he is born in. E.B. Tyler, the famous anthropologist, defined culture as, 'It is that complex whole which includes knowledge, beliefs, morals, law, custom and many other capabilities and habits acquired by man as a member of society.'

Culture refers to total life activities of a society. What people think or do and feel constitute the culture of a society. It is the physical way of life, social institutions and psychology of the people fused together. Biological inheritance is the same in human beings all over the world but it is the difference in their cultural conditions

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which develops distinctive personality characteristics in the individuals of different cultural groups. We can easily identify people reared in different cultures by the personality patterns they possess. English, American, African and Indian can be identified by their cultural backgrounds. India is a big country having many sub-cultures within a broad culture. The personality of individuals within these sub-cultures is molded by the customs, beliefs, rituals and religious faiths and early childhood training of children. Culture is a great educator of human beings, sometimes directly and sometimes indirectly by the methods of training and passing on great social heritage, it leaves permanent impression on the personality of the child.

The importance of cultural forces in the development of personality is very great. The influence can be understood by an example. Suppose there are three identical twins who are adopted in three sub-cultures—homes of Muslim, Christian and orthodox Hindu. They are reared and trained in three different cultural backgrounds. It is obvious that the impact of culture will produce three distinctive types of personalities. Our attitudes, needs and aspirations are regulated by our culture. C. Kluckhohn, emphasizing the importance of culture in the life of the individual, said, 'Culture regulates our lives at every turn. From the moment we are born until we die there, whether we are conscious of it or not, constant pressure upon us to follow certain types of behaviour that other men have created for us.' In the course of development, society stabilized certain patterns of behaviour which are followed by the members of a society. It develops certain common personality characteristics in the members. Common characteristics develop in the members of a cultural group on three principles:

- Early experiences which the child gets in a culture.
- Child-rearing practices are culturally patterned so that children in a society are subjected to similar early experiences.
- Similar experiences lead to similar personality configuration.

Culture influences the personality development of an individual in the following ways:

- Internalization of values, ideas, beliefs and customs through the process of learning. A child since his birth is reared in a definite cultural background where he is taught values, customs, and beliefs, etc. which create distinctive personality characteristics in the child.
- Institutionalization: Buildings of various religious prayers, books and cultural programs.

Many religions, faiths and creeds are found in India that follow different religious faiths, beliefs, prayers and cultural programs which create unique personality characteristics among the followers of different religions.

Anthropologists have made a study of the impact of culture on personality development. Margaret Mead conducted a study on adolescents in Samoa, a primitive culture. She concluded in her study that cultural conditions play an important role in moulding the personality patterns of individuals. According to her findings, the development of the sense of security seemed to be one of the chief factors determining the formation of personality.

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6.3 THEORIES OF PERSONALITY THEORIES OF PERSONALITY

Psychologists have developed several theories of personality to study its structure and growth. Some of these are as follows:

- Type theory
- Trait theory
- Psychoanalytic theory
- Phenomenological theories
- Learning theory of personality
- Social Behaviour theory
- Rotter's Expectancy-Reinforcement model

6.3.1 Type Theories

It has been the nature of people, from ancient times, to name and classify objects of the environment and human beings into different categories called types. The old system of typology still continues and in modern times. Greek physicians were the first in 5 BC, who classified people four broad categories on the basis of emotional and temperamental characteristics. One of Aristotle's pupils theorized that human body consists of four fluids. The personality of an individual is typed by the dominance of one of them in the body. The four types of fluids are as follows:

S.No.	Humour	Temperament	Characteristics
1.	Blood	Sanguine	Active, hopeful
2.	Yellow bile	Choleric	Irritability, quick to anger
3.	Phlegm (Mucus)	Phlegmatic	Calm, temperamentally sluggish
4.	Black bile	Melancholic	Depressed, slow and pessimistic

If we study our own scriptures we find in that ancient India there existed an advanced system of Ayurveda, in which our ancient physicians broadly categorized all human beings on the basis of three elements in the body. The predominance of one of the three decided the category of the person. It appears that this system of Hippocrates and Indian physicians were, more or less, similar. The three elements, which the Indian physicians theorized are *pitt* (bile), *bat* (wind) and *kuf* (mucus). A number of typologies have been attempted for constitutional, temperamental and behavioural types of persons by philosophers and psychologists in the ancient and current literature.

Constitutional type

Ernest Kretschmer, a German psychiatrist, classified human beings on the basis of physical constitution. He attempted to establish relationship between personality characteristics and body type.

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S.No.	Type	Characteristics
1.	Pyknic	Stocky, full-chested, popular
2.	Asthenic (Leptosomic)	Weak, tall, sensitive and thin
3.	Athletic	Strong
4.	Dysplastic	Mixed type

Somato type

William H. Sheldon, an American surgeon, divided all human beings into three broad categories of physical dimensions and their corresponding temperamental characteristics. He believed that physical structure of the body is the determinant of personality characteristics.

S.No.	Physical characteristics	Temperament
1.	Endomorphic (soft, round)	Viscerotonic (Sociable, extrovert affectionate) Love of physical comfort
2.	Mesomorphic (muscular and strong)	Somatotonic (energetic and muscular, love of risk and chance)
3.	Ectomorphic (thin and tall)	Cerebrotonic (fearful, artistic introvert and restrained)

Spranger's type

E. Spranger, German philosopher, divided human beings on the basis of interest, in the following categories:

- Theoretical:** Persons who are theoretical in nature neglect social and political participation
- Economic:** Persons who are interested in money-hoarding
- Aesthetic:** Persons who are lovers of beauty and are busy in sensuous gratification
- Social:** Persons who are interested in social activities
- Political:** Dominating and desirous of power
- Religious:** Persons who devote themselves to religious activities and mysticism

Jung's Typology

Jung, a Swiss psychiatrist, attempted to classify human beings on two behavioural dimensions: extrovert and introvert. His typology is widely known and is most influential among professional workers. The major characteristics of two types are as follows:

- Introvert:** Defined as a person who tends to withdraw into himself, especially when facing emotional conflicts and stress in the environment. An introvert individual is shy, avoids people and enjoys being alone. Scientists and philosophers may be termed as introverts.

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2. **Extrovert:** In contrast to the introvert type, an extrovert person's orientation is towards the external world. He deals with people intelligently in social situations. He is conventional, outgoing, social, friendly and free from worries.

Social workers, politicians, business executives may be typed as extroverts. These two broad categories have been further classified on the basis of rational and irrational processes.

Jung's system of classification of human beings is eight-fold and not two-fold as is popularly known. A person, according to Jung, may be extrovert for one function, for example, feeling and the same person may be introvert in intuition. All persons can be divided into eight types, based on the dominance of one of the above factors. Modern writers have introduced the type 'ambivert', between two extreme poles of extroversion and introversion. Ambivert refers to those persons who can be classified as neither extroverts nor introverts.

Freud's typology

Freud, on the basis of his theory of psycho-sexual development, identified three types of personality. The type depends on the fixation of sexual energy at a particular stage of sex development. The three types are as follows:

1. **Oral-erotic type:** According to Freud, sex in infancy is located within a month of birth. There is a membrane in the mouth which, when irritated gives pleasure to the infant. Sexual gratification at this stage involves activities related to mouth. Oral-erotic type of personality shows excessive degree of pleasures associated with oral activity. Sucking, biting or putting anything in the mouth gratifies sex in infancy. Fixation at the oral stage results in two types of personality in later life.
 - (i) **Oral passive type:** This type of person is dependent, optimistic and immature in his/her thinking and other activities like a child. He/she expects help from other people.
 - (ii) **Oral sadistic type:** This type of person is pessimistic. He/she is suspicious and aggressive. He/she is often bitter in his/her dealings with others.
2. **The anal type:** The second stage of sex development is anal, when the child obtains gratifications through anal activities. These activities generally relate to the expulsion of fecal material through the anus or the retention of these materials in response to the social demands of toilet training. Some traits of personality develop due to fixation of sex energy at this stages include obstinacy, miserliness, orderliness, etc., in later life.
3. **The phallic type:** The third stage of psycho-sexual development is phallic. This type of person shows self-love and exhibitionism. He tries to draw the attention of others. These characteristics are found in early adolescence.

Evaluation of the type approach

Classification of human beings into types has been generally criticized by psychologists on the basis that typologies tend to place emphasis upon one or another phase of development. They deal with extreme rather than mediocrity of human nature. It is very difficult to categorize individuals under one of the types as proposed by some typologists. Two or three types are wholly inadequate to describe human varieties of behaviour into a few limited categories. The second criticism of typology is that types

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are discontinuous and non-scalable. There is multiplicity of type theories, which are very difficult to apply in practice.

Criticism does not mean that typology is useless. Typology has its historical value in the sense that it was the first attempt to typify people, which generated a great deal of research. The second important contribution of typology is that it attempts to assess the personality of an individual as a whole. It does not study personality in fragments of traits. The type approach is very useful for psychologists who attempt to comprehend the personality of an individual as a whole.

The third advantage of typology is that types are useful and valuable from the point of view of experiments in physical science, where attention to certain process in a relatively pure form is uncontaminated by accidental and confusing factors. Lastly, we can say that they serve one very important function as reference points or guides for the examination of dimensions of personality by different psychologists.

6.3.2 Trait Theory

Typology and trait approaches are interrelated to each other in the sense that typology includes a wide variety of traits in classifying human beings in broad types while in trait approach we label or call a person by a specific mode of behaviour, which he shows in a variety of circumstances.

In modern psychology, the type approach is not so widely used as the trait approach to understand the development of personality. In our daily life, we label traits as honest aggressive, fearful, dependent, lazy, dull, etc. In the simplest sense, by trait we mean a mode of behaviour manifested in number of life situations consistently. It is any distinguishable, relatively enduring way in which one individual varies from other. Trait may be defined, 'as a property within the individual that accounts for his unique but relatively stable reactions to the environment.'

Walter Mischel, in his book, *Introduction to Personality*, states, 'trait is a continuous dimension on which individual differences may be arranged quantitatively in terms of the amount of the characteristics, the individual has.'

Let us now explain the process of development of trait theory. 'Trait' in daily life, first, is used simply as an adjective, for instance, 'Ram behaves in a lazy way in several situations'. The description is generalized from individual behaviour to the individual (Ram), we say that he (Ram) is lazy. Laziness becomes a trait of Ram's personality, a characteristic mode of his behaviour.

Development of friendliness

Stimuli	Trait	Responses
1. Meeting friends	Friendliness	1. Helpful
2. Meeting with strangers		2. Pleasant
3. Dealing with poor, disabled children		3. Warm and interested

Some properties of traits

- **Scalability:** Traits are scalable. They can be measured and scaled quantitatively.
- **Inference from behaviour:** Personality traits are not directly observable but are manifested in a number of activities and verbal expression. We infer a trait from the behaviour of the individual.

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- **Flexibility:** Traits are not static in nature. Traits are flexible in childhood. They become stable with the maturity of the person with age but some variability is always present.
- **Universality:** There are certain traits, which are universal in nature like height and weight.
- **Functional unity:** The trait must have functional utility. It means that there must be different indications, which may vary or are manifested consistently in the behaviour of the individual.
- **Traits are higher order habits:** Guthrie conceived that a trait is a higher order habit, which recurs in behaviour frequently.
- **Traits are mental sets:** Some psychologists define traits as a mental set. It is a readiness to respond to any variety of situations in a consistent way. Cason stated that there is a generalized tendency in some people to be annoyed easily.
- **Traits are frame of reference:** The personality of an individual is an organized whole of beliefs, emotions, etc., about the environment. In this reference, traits are organized frames of references.
- **Traits are learned:** Traits are learned during interaction with the environmental stimuli. They are biologically determined as neuroticism and other traits, which depend on the disposition and intellectual potentialities of the individual.

G.W. Allport's Classification

G.W. Allport is one of the most outstanding trait psychologists. His conception and research on trait approach to personality has had an immense influence on psychologists. He has conceived that traits have a real and vital existence. He defined a trait, 'as a generalized and focalized neuropsychic system with the capacity to render many stimuli functionally equivalent and to imitate and guide consistent forms of adaptive and expressive behaviour.' The definition given by Allport is a comprehensive one. It emphasizes that traits are not linked with a small number of stimuli but are general and enduring in nature. He classified all human traits into three broad categories as follows:

- Cardinal traits:** Traits that appear the most in the behaviour of an organism are called cardinal. It may be illustrated with the example of achievement in life. Some people are so devoted to achievement that this trait pervades their entire life.
- Central traits:** Central traits are less pervasive than cardinal traits but are generalized dispositions.
- Secondary dispositions:** Secondary dispositions are specific and narrow traits. They are also known as attitudes.

According to Allport, traits differ in intensity and magnitude in general population from individual to individual. No two individuals are alike in their behaviour. People operate in their unique way in the environment. Each individual is unique in terms of adjustment to their environment.

R.B. Cattell's Classification

Raymond B. Cattell is another ardent propounder of trait theory of personality. The basic structural element for him is the trait. He stated that a trait is the structure of

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personality inferred from behaviour in different situations. He classified traits into four categories:

- Common traits:** There are certain traits, which are widely distributed in general population or among all groups. They are known as common traits. Generally, aggression and cooperation can be considered common traits.
- Unique traits:** These traits are possessed by particular persons like temperamental traits, emotional reactions, etc.
- Surface traits:** Traits that can be easily recognized by overt manifestation of behaviour are called surface traits, such as, curiosity, integrity, honesty, tactfulness and dependability.
- Source traits:** Source traits are the underlying structure of sources that determine behaviour. Dominance and emotionality are source traits. Cattell, through the factor analytic approach, determined the contribution of hereditary and learning factors in the development of traits in the individual. He emphasized on the importance of interaction between hereditary and environmental influences in personality development.

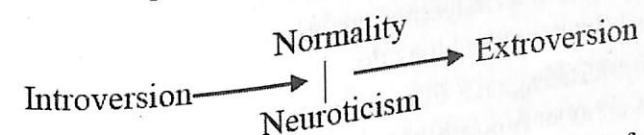
H.J. Eysenck's Classification

H.J. Eysenck, a British psychologist, devoted much of his research studies to explore the trait dimensions. He conducted extensive research on trait dimensions by applying quantitative techniques of factor analysis. He conducted research on ten thousand soldiers and by statistical analysis isolated two dimensions in personality:

- Introversion and extroversion
- Neuroticism

Later on, he isolated another personality dimension as psychoticism. According to Eysenck, psychoticism is an independent dimension of personality. It is quite different from the introversion-extroversion, dimension. Eysenck has found three fundamental dimensions of personality.

- Introversion vs. extroversion
 - Normality vs. neuroticism
 - Psychoticism
- The first two dimensions given above may be taken as the part of normal personality. Their relationship is presented as follows:



Eysenck developed personality inventory to test the traits of personality. His findings have generated research activities by several psychologists. His most important contribution is that he tried to prove that personality is genetically caused. He traced neuroticism to the autonomic nervous system and introversion-extroversion to central nervous system. He emphasized the importance of heredity in the development of traits of personality as against the concept of American psychologists who are biased in favour of environment.

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Common features of trait theories

Though trait theories disagree with the specific content and structure of the traits needed to describe personality, there is still agreement on the general concept of traits:

- **Consistency of traits:** All theories agree that traits are consistent in an individual's behaviour. They are not temporary dispositions but enduring characteristics of the individual.
- **Trait dimensions:** There is agreement as regards the various dimensions of traits as source traits and surface traits, common and unique, broad and narrow. Traits vary in breadth and generality.
- **Traits are dispositions:** Traits fluctuate or change in a person's position with respect to a disposition. All psychologists are committed in their search of broad and stable traits.

Criticism of trait theory

The trait theory of personality has often been criticized by many psychologists in recent years. The main points of criticism are as follows:

- There is no agreement among psychologists concerning the use of the terms.
- There is a view that a trait is a behavioural disposition, which is consistent and does not vary from situation to situation. In daily observation, we find that if a man possesses friendliness as a trait, he does not behave in a friendly manner in all the situations of life. Trait is not a permanent or a static characteristic of the individual because personality does undergo change.
- Another difficulty is the quantification of human traits as there is no zero reference and equality of units in trait measurement. There is no suitable measuring tool of trait dimensions. Generally, traits are measured with the help of paper-pencil tests, which can be manipulated by the subject by giving fake information.
- 'Halo effect' operates when a person rates an individual very high on a specific trait. He may rate the same person on other traits equally high.
- The behaviour of an individual cannot be predicted on the basis of scores on trait inventory. Traits are the only point of references. An examination of the personality traits of an individual enables us to make only probability statements about what the individual may do.
- The last criticism against trait theory is that it is still unclear whether a trait is viewed as an inner process that causes difference among individuals or is it the situation that brings into play certain organizational tendencies, which create the behaviour.

6.3.3 Psychoanalytic Theory of Personality

We will now discuss different theories of personality that emphasize on the dynamics of human behaviour. We will outline the views of classical psycho-analysis and examine the views of neo-Freudians who deviate from Freud but claim to be psychoanalysts.

(i) Freud's theory

Basic concepts

Sigmund Freud was the first psychologist who placed great importance on instincts as the determinant of human behaviour. He proposed two instincts: (i) Eros, (love and the self-preservation), (ii) Thanatos, (death instinct, as the ultimate cause of all human activity).

Psychic structure

Psychic energy, according to Freud, comes from libido. It denotes sexual energy. When Freud revised his theory, which included two groups of instincts, sexual libido was regarded as the primary driving force of personality. The dynamics of personality is seen as largely governed by the need to gratify the libido.

Id: Implies inborn and its main function is the discharge of psychic energy, which when pent up produces tension through the personality system. Identity operates on animal level. It cannot differentiate between good and bad and operates on the principle of pleasure. The primary process of thinking and explaining id behaviour, resulting from pent up tensions is described by Freud as frustration. The primary process attempts to discharge tensions by bringing into consciousness, memories associated with the source of frustration.

The ego: The id knows only the subjective reality of the mind. The second concept of Freud is the ego, which distinguishes between subjective reality and things in the external environment. It operates on the principle of reality. The ego is called the executive of personality. It obeys the reality principle and operates by means of secondary process. The pleasure principle is only concerned with whether an experience is painful or pleasant; the principle of reality is concerned with whether it is true or false. The ego formulates a plan for the satisfaction of the need and executes it, keeping into consideration the reality principle. It often integrates the conflicting demands of id, the super ego and the external world.

The ego is an organized portion of the id, which has been modified by the contact of external reality and experience. It comes into existence to forward the aims of the id. It brings a compromise between the instinctual urges of the id and demands and forces of the external environment. Freud remarked about the function of ego: 'The poor ego has to serve three harsh masters and has to do its best to reconcile the demands of all three.'

Explaining the relationship between ego and the id, Freud once said, 'Imagine that the relationship between the ego and the id is similar to the relationship between a horse (id) and its rider (ego). While the rider usually determines the direction of the horse, there are those times when it is the horse who leads the rider.'

The super ego: The third concept is the super ego. It is the agency that internalizes the parental influences and ideals of society through early childhood experiences. It represents the ideal rather than the real and strives for perfection. It works in accordance with the moral standards authorized by the agents of society.

Let us explain it with the help of an example: Suppose there is a beautiful toy in the room, a child sees it and runs towards it, this is the id level. The second stage occurs when the parents instruct the child, not to touch the toy. The child sees the toy but does not touch it out of fear of punishment in the presence of the parents. The

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third stage of development is when the toy is in the room and the parents are not there but the child does not touch the toy. This is the super ego. The super ego involves the internalization of parental control in the form of self-control. We can say that id is biological and seeks pleasure; ego is a psychological test reality. The super ego represents the social-self and seeks perfection.

The super ego develops gradually by the process of reward and punishment meted out by the parents to the child in early childhood training. The parental reward and punishment is substituted by self-control. An individual with a well-developed super ego refrains from bad or evil temptations, such as stealing or telling a lie, etc., even in the absence of the punishing agent. The process of adoption of the moral and ethical standards of family and society is called the process of introjections.

Dynamics of personality

According to Freud, the human organism is a complex energy system that derives its energy from the food it consumes. The energy created by biological factors may be transformed to psychic energy. The three parts of the psychic structure, i.e., id, ego and super ego are in constant conflict. The dynamics of personality involves a continuous interaction and clash between id impulses seeking release and inhibition imposed by the super ego. The individual is in quest for immediate gratification of impulses, seeks pleasure and avoids pain in order to reduce tension. The drive for immediate satisfaction of instinctual demands leads to early clash between the individual and environment. Conflicts develop when the parents or other members impose restriction or control on expression. There is a perpetual warfare between the pressure of the environment and the demands of the id and super ego. The ego, in order to adjust in the social environment, utilizes a number of mental mechanisms to it and the demands of the id and the super ego reduce the tensions of the individual.

Educational Implications of the Theories of Personality

Theories of personality have important educational implications. Trait theory of personality acquaints the teacher with the various traits that need to be adequately developed in the students.

Conscious mind is just one-tenth of the mind and unconscious mind is nine-tenth of it. Knowledge of the unconscious mind of the students is a must for the teacher. A teacher cannot take effective measures for the personality development of the students unless he has adequate knowledge in this regard. He must understand that the students have depressed desires and it is his duty to make use of various defence mechanisms. The teacher should also understand the three tiers of the mind—the Id, the Ego and Super Ego. The teacher is expected to redirect the pent-up feelings of his students to healthy or normal channels. Psychoanalysis brings out the importance of proper environment for the education of students. It has given impetus to such movements as *Child Guidance*, *Mental Hygiene* and *Freedom of the Child*.

Adler has laid more emphasis on individual differences. This is a useful point for teachers.

The concept of inferiority complex is a valuable concept for the teacher.

Dream analysis of Jung indicates that disturbing complexes relate not only to the past, but also have implications for the present and the future. The concept of introversion and extroversion is very helpful to the teacher to understand the personalities of his students.

Check Your Progress

1. Differentiate between 'trait theory' and 'social learning theory'.
2. How does genetic and cultural factors effect personality?

6.4 MENTAL HEALTH

Mental health of the learner is very important for efficient learning and proper development of personality. A child is born in a home where he remains in the constant company of his mother in the formative years of his infancy. Traditionally, it is said that a mother is equal to hundred teachers. The impressions and experiences which a child has in these formative years leave permanent and indelible impressions on his mind. From the point of view of psychoanalysis, early childhood experiences are very important for the future development of personality. The parents, of course, since they control children during infancy, are in the most strategic position to inculcate positive habits in their children.

The first important requisite condition is affection and love of parents and other members of the family. The infant should feel secure and loved in his home. Parents should meet the legitimate needs of their child. Proper and conducive environment should be provided in early childhood. Pleasant and satisfaction giving experiences should be provided for the harmonious development of the personality of the child. The parents should keep the following things into consideration:

1. Provide proper affection and love to the child
2. Provide a conducive environment at home
3. Avoid criticizing the child
4. Avoid comparing the child with other children
5. Avoid rejecting or overprotecting the child
6. Avoid quarrelling in the presence of the child
7. Avoid being over anxious about the future of the child
8. Being democratic in dealings
9. Meeting the legitimate needs of the child
10. Providing guidance where necessary
11. Building self-confidence in the child

All look to the school as the second line of defence. The school assumes great responsibility in the process of harmonious development of personality. Children spend six to seven hours in school. Schools are in a position to help in the development of children's potentialities by catering to their needs. The following are the various measures, which can be taken in schools for the proper development of physical, mental and spiritual abilities of children:

School environment; Democratic environment; Provision for curricular activities; Teacher's role; Freedom of expression; Variety of interests; Reading for mental health; Classes in human relations; Provision for sex and moral education; Art and craft; Guidance

So far, we have been talking about the mental health of students, causes and remedial measures to check maladjustment among students. Teachers' mental health plays an important role in the teaching-learning process. If the teacher is not in sound mental health, he can do incalculable harm to the nation in terms of poor guidance to the students. He cannot do justice to his job. His maladjustment will not only adversely affect his personality but will produce maladjustment in children put under his charge.

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6.4.1 Conflict and Frustration

Frustration is the outcome of obstacles in the path of an individual's goal or objective. It is an unpleasant emotional state of mind in which the individual feels frustrated because some objects or situation create hindrance in the achievement of a particular goal. All of us have a number of needs and desires. These needs and desires differ from individual to individual and are different for different age groups. If these desires and needs are not satisfied or fulfilled, then frustration sets in.

According to Barney and Lehner, frustration refers to a failure to satisfy a basic need because of either conditions or external obstacles.

According to Good, frustration means emotional tension resulting from the blocking of a desire or need. Munn defined it as 'a state of organism resulting, when the satisfaction of motivated behaviour is rendered difficult or impossible.'

Causes of Frustration

Frustrations can be the result of many external causes such as physical, economic or social.

Social factors

Every individual lives in a society and follows the norms, customs and traditions of that society. If the individual has a conflict with the society's customs and rules of conduct, then it leads to frustration. For example, if a man wants to do an inter-caste marriage, which is considered to be wrong according to the norms of the society in which he lives, then the individual becomes frustrated or a young girl who is not allowed to party till late night feels frustrated.

Physical factors

Every human being inhabits a physical environment. The physical environment presents obstacles like bad weather, floods, drought, etc. For example, if an individual, going for an interview, gets stuck in rain, he or she may feel extremely frustrated for being unable to reach his or her destination.

Economic factors

An individual is influenced by economic factors like economic status, demand and supply of commodities in the market, prices of essential commodities and availability of consumer goods. Any deficit in these factors may frustrate an individual. A farmer who has a bad crop gets frustrated because he cannot earn and feed his family.

Internal factors

The internal factors are those factors which are present within the individual. It also includes mental and physical deficiencies like paralysis, blindness, deafness. Sometimes, an individual's moral ethics and ideals may turn out to be a source of frustration.

Sources of Frustration

There are various sources of frustration, which are as follows:

A major source of frustration is conflict. The cause of conflict can be two desires or two types of behaviours, which are not compatible with one another. Conflict is an unpleasant state of mind. When it becomes difficult for an individual to decide which desire should be satisfied, he or she becomes frustrated. This inner state of mind is characterized by tension as a result of the presence of mutually exclusive or opposing tendencies/impulses or desires, at the same time, is described as conflict.

Thus, conflict is a painful state or condition of an individual. One feels intense emotional tension during this state. Tension is the result of the presence of two or more desires or wishes in an individual. These desires are contradictory in nature and therefore cannot be satisfied fully at a given time. The individual, being at the crossroads, is not able to choose between the two opposing desires, and becomes tense and restless. The person becomes a victim of the two opposing desires and suffers from an inner conflict.

There are three types of conflicts. These are as follows:

- (i) **Approach-approach conflict:** In this type of conflict, an individual has two or more positive goals and has to choose between the two. Both these goals are equally interesting and beneficial to him or her. For example, a child may have a conflict if he or she cannot decide whether to go to the zoo or play with his or her friends.
- (ii) **Avoidance-avoidance conflict:** In this type of conflict, the individual is caught in a situation in which he or she wants to avoid any of the two actions or situations. Both the actions are equally unattractive to the individual because of which he or she wants to avoid both of them. In such a situation, if one is compelled to take a decision to choose one, then it results in a state of mental conflict. For example, an individual who fears entering the boxing ring has to decide whether he should do boxing or face the stigma of being a loser. The threats involved in both the situations are unattractive.
- (iii) **Approach-avoidance conflict:** This type of conflict results when an individual is faced with a situation, which is attractive and negative at the same time. One experiences a state of conflict because one has to decide whether one wants to approach the situation or avoid it. For example, a person might be motivated to steal a few things from a shop but at the same time, he may perceive it to be wrong according to his morals. These types of conflicts are severe in nature and may result in mental tension.

Reasons leading to conflict

There are a number of factors because of which an individual may feel dissatisfied. It can be the presence of two contradictory desires, which leads to a conflict. There are also numerous other things like the family environment, school environment and social and cultural environment, which are the potential sources of conflict.

- **Family environment:** This is the most important factor that results in conflicts. Unhealthy atmosphere at home due to unpleasant relations between the parents makes children either aggressive or overly submissive. These factors lead to mental conflicts.
- **School environment:** Sometimes the school does not allow self expression in children. The child becomes shy and does not get an opportunity to take prompt decisions. These factors are sources of mental conflicts.
- **Social and cultural factors:** Many factors like social taboos, norms and forced inhibitions are potential sources of conflicts for an individual living in a traditional society. For instance, sexual desires are considered to be unethical in the traditional society, which results in conflicts in the mind of youth. Similarly, if a person is not able to fulfill the desire for social status then also he or she experiences mental conflict. Poor financial condition and career dissatisfaction are other sources of conflict.

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Conflict Management Strategies

It is a fact that conflict can lead to functional as well as dysfunctional effects. There are a number of approaches that are helpful in managing the conflict. These are as follows:

- **Ignoring the conflict (avoidance):** If the conflict is not too severe and the consequences are not very serious then it can be easily ignored. It is assumed that it will be eventually resolved by itself. This strategy is also referred to as avoidance. It is mostly used when the issue is trivial in nature and when potential disruptions outweigh the benefits of resolution.

Thus, it is characterized by trying to put off the conflict by ignoring or changing the topic and being vague about positions or preferences. The individual who prefers this style of conflict shows little concern for his or her own goals.

- **Compromising:** There is no clear winner in this type of conflict. It is best used when temporary settlements to complex issues are required. Each party is concerned about its own goal accomplishment and is willing to engage in give-and-take exchange to reach a reasonable solution. It is an approach that results in some gains and some losses for each party. The most important benefit of compromise is that all issues get addressed without either party being in the unequal power positions.

- **Collaboration:** Collaboration is a method of handling conflict in which both the parties involved in the conflict try to handle it without making concessions and by coming up with a new way to resolve their differences that provides some kind of a solution to both.

The main prerequisite to collaboration is a shared commitment to work together in order to produce steps that neither party could envision or accomplish alone.

- **Negotiation:** Negotiation is a method of conflict resolution in which both the parties of equal power try to find an acceptable solution by considering various alternatives to allocate resources to each other. In *distributive negotiation* type of conflict resolution, parties see conflict as a win-or-lose situation because they believe that the resource base of the conflict is fixed. Therefore, one party will win while the other will not win. In *integrative negotiation*, parties can increase total resources by coming up with a new solution that is a win-win for both.

Frustration can be caused due to environmental factors, personal reasons or conflicts. There are a number of consequences of this frustration. Frustration causes various types of reactions, which vary according to the intensity and the person who experiences this frustration. Some people have a tolerance to frustration while others become violent and aggressive. Some of the common reactions to frustration are: restlessness and tension; aggression; anxiety.

6.5 CONCEPT OF ADJUSTMENT

Teachers are more concerned with the concept of adjustment because the primary purpose of education is to train children to solve life's personal, social and economic problems. If you examine the various activities of an individual's life, you will find that most of them involve adjustment of the individual to his vocational, social and economic problems. The process of adjustment starts right from the birth of the child and continues till his death.

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3. Give an example of approach-approach type of conflict.
4. List the common reactions to frustration.

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The concept of adjustment is as old as human race on earth. Systematic emergence of this concept starts from Darwin. In those days, the concept was purely biological and he used the term 'adaptation'. The adaptability to environmental hazards goes on increasing as we proceed on the phylogenetic scale from the lower extreme to the higher extreme of life. Insects and germs, in comparison to human beings, cannot withstand the hazards of changing conditions in the environment and as the season changes, they die. Hundreds of species of insects and germs perish as soon as the winter begins.

Psychologists have interpreted adjustment from two important points of view. First, adjustment as an achievement; and second, adjustment as a process. The first point of view emphasizes the quality or efficiency of adjustment and the second lays emphasis on the process by which an individual adjusts in his external environment.

Now, let us examine both of these approaches in detail.

1. **Adjustment as Achievement:** Adjustment as an achievement means how efficiently an individual can perform his duties in different circumstances. Business, military, education and other social activities need efficient and well-adjusted men for the progress of the nation.

If we interpret adjustment as achievement then we will have to set the criteria to judge the quality of adjustment.

2. **Adjustment as Process:** Adjustment as a process is of major importance for psychologists, teachers and parents. To analyse the process, you should study the development of an individual longitudinally from his birth onwards. The child, at the time of his birth, is absolutely dependent on others for the satisfaction of his needs, but gradually with age, he learns to control his needs. His adjustment largely depends on his interaction with the external environment in which he lives. When the child is born, the world, for him, is a big buzzing, blooming confusion. He cannot differentiate among the various objects of his environment but as he matures, he comes to learn to articulate the details of his environment through the process of sensation, perception and conception. The child in his infancy can respond and think about only concrete objects of his environment. The process of abstraction comes afterwards. Young children lack the capacity of self-control of the instinctive impulses. They try to take hold of anything that appears bright to their senses. Their development is purely on instinctive level. The nature of adjustive process is decided by a number of factors, particularly, internal needs and external demands of the child.

6.5.1 Adjustment Barriers

Sometimes, it is very hard to adjust to the change in the environment. For example, if due to transfer of the father to some other state, the child is admitted to a new school, it is very hard to adjust to the new friends and teachers. Thus, the child may have psychological barriers to adjust to the life and studies in the new school. Sometimes, the culture of the new school, such as timings, new course, medium of language (English/Hindi/regional language), etc. can pose as a barrier in the adjustment and fine-tuning of a newcomer.

Implications of cross-cultural training

Although psychological barriers to adjustment could be overcome with the passage of time, immense damage may take place during the initial, setting-in period in the aforementioned situations. Therefore, it is advised to the parents and teachers of such

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a child that they should help the child in overcoming such adjustment barriers by giving extra attention, enhancing confidence, focusing on cross-cultural differences which they face.

Adjustment Mechanisms

There are some common ways, which the individuals use to defend or escape from conflicts and frustration. These are known as defence or adjustment mechanisms. An adjustment mechanism may be defined as 'any habitual method of overcoming blocks, reaching goals, satisfying motives, relieving frustration and maintaining equilibrium.'

6.5.2 Characteristics of Adjustment Mechanisms

The following are the characteristics of adjustment mechanisms:

1. Adjustment mechanisms are almost used by all people. They are constructs, which are inferred from the behaviour of the individuals. They have protective orientation. All mechanisms are used to protect or enhance the person's self-esteem against dangers. They defend the person against anxiety and frustration. They increase satisfaction and help in the process of adjustment if used within limit.
2. The danger is always within the person. He fears his own motives. The fear and danger are manifested in adjustment mechanisms.
3. Invariably in all adjustment mechanisms, the individual distorts reality in one way or the other, because the method of protecting against dangerous inner impulses or escaping from anxiety involves some kind of distortion of the conscious representation of the person's impulses.
4. The overall effect of adjustment mechanisms is to cripple the individual's functioning and development through falsifying some aspects of his impulses so that he is deprived of accurate self-knowledge as a basis for action. There is self-deception underlying all adjustment mechanisms. We deny and disguise the real cause of our behaviour in order to maintain the balance of our personality.
5. Adjustment mechanisms are learned in the environment. They are designed to deal with anxiety, inner conflicts and self-devaluation. They operate on habitual and automatic levels.

Some common adjustment mechanisms are as follows:

1. **Simple Denial:** The easiest way to maintain the balance of personality is to deny the fact, which could create conflict in the mind. When children are busy in play activities, if parents call them, the children will say they heard nothing. In fact, what was said was not allowed to penetrate into their consciousness.
2. **Aggression:** Aggression is a typical adjustment mechanism used as an attempt to hurt or destroy the source of frustration. It may be classified into two broad categories:
 - (i) **Extrapunitive:** Extrapunitive responses are those in which the individual aggressively attributes the frustration to external persons or things.
 - (ii) **Intropunitive:** Intropunitive responses are those in which the individual aggressively attributes frustration to himself. Sometimes, the person feels that he himself is the source of frustration.

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The release of pent-up feelings through aggression gives relief to the person. The teacher by his sympathy, fair treatment, and by organizing positive programmes for catharsis, can reduce aggression among children.

3. **Compensation:** Every person tends to make up deficiency of one trait or area of development in another area. When a person feels weak and fails in one area, he compensates in another field. He works hard to become strong and successful. Needs, which are frustrated and unmet, are gratified in order to release tension and conflict. Compensation is generally of the following types:
 - (i) Direct compensation
 - (ii) Over compensation
 - (iii) Substitute compensation
 - (iv) Indirect compensation
 - (v) Neurotic compensation

4. **Sublimation:** It is a substitute reaction, which may be classified as compensation. Among all the mental mechanisms of defence, sublimation is the most advanced, highly developed and constructive mechanism. Through the use of its operation, the energy of personally or socially intolerable impulses and drives is successfully directed into consciously acceptable channels.

Sublimation has been defined as a major mental mechanism operating outside and beyond conscious awareness, through which instinctual drives, which are consciously unacceptable or blocked and unobtainable, are diverted so as to secure their disguised external expression and utilization in channels of personal and social acceptability. In successful sublimation, the direction and aim of the repressed drives have been deflected into new pathways of creative endeavour.

5. **Identification:** Identification is a mental mechanism operating outside and beyond conscious awareness through which an individual, in varying degree, makes himself like someone else; he identifies himself with another person. Children identify themselves with their parents and parents frequently identify themselves with their children and with some justification, regard the achievements and successes of their daughters and sons as their personal triumphs. Hero worship is an obvious form of identification.

6. **Projection:** Attributing to and observing in others one's own impulses and traits is called projection. It is the most common adjustment mechanism, which is used by all people in daily life. Freud used projection as a process by which we ascribe to the external world the rejected impulses of the id. We defend ourselves against our repressed guilt feelings by projecting them into other things and people.

7. **Rationalization:** Rationalization has been defined as a mechanism by which the individual justifies his beliefs and actions by giving reasons other than those which activated or motivated him. The window dressing of motives and actions is called rationalization. In order to preserve self-respect and the good opinion of others, most people, with conscious intent, substitute 'good' reasons for real reasons so that their actions may appear justified, logical and socially acceptable. Rationalization is the most popular adjustment mechanism, which is used almost by all persons in daily life. It is a response to reality that falsify circumstances.

8. **Regression:** Regression has been defined as, 'an unconscious back tracking' either in memory or in behaviour, which might have been successful in the

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past. The adult who has been frustrated in fulfilling his needs may return to more primitive modes of behaviour. He may cry like a child and have temper tantrums.

9. **Repression:** Repression is a dynamism, which is fundamental in Freudian theory of personality. It has been defined as motivated forgetting. White (1964) defined repression as 'the forgetting or ejection from consciousness of memories of threat and especially the ejection from awareness of impulses in oneself that might have objectionable consequences.' It is an attempt by the individual to push into the unconscious those experiences and thoughts which are in conflict with his moral standard or which are painful to contemplate.

10. **Reaction formation:** Reaction formation is also called reversal formation. In reaction formation, an individual controls undesirable or socially unacceptable urges to deny their existence and develops diametrically opposed traits that disguise and check the more basic motives. It is to substitute opposite reaction formation, which causes anxiety. Repression is accompanied by behaviour and feelings exactly opposed to the repressed tendency.

11. **Negativism:** Negativism is a mechanism by which an individual draws the attention of other persons. It is partly a defence and partly an escape mechanism. The person develops strong and irrational resistance in accepting the suggestions of others. The use of this mechanism is at a peak at the age of two to three years.

Students have some negative feelings toward their teachers. Negative feelings do not serve some useful purpose but they hinder the achievement of goals.

12. **Fantasy:** It is a fact that, mostly, we think to reduce our frustrations. Our thoughts can be a realistic effort to remove the obstacles that make us anxious. They can also provide an escape from frustration by giving us imaginary satisfaction, hungry men dream of food, unsuccessful men dream of success. Fantasy is a mechanism of wish-fulfilling.

Neurotic Adjustment Mechanisms

The behaviour that deviates from conventional ways of responding is called neurotic behaviour. It implies that something is wrong either with the functioning of a person's nervous system or with his psyche.

1. Neurotic anxiety

An anxiety is a vague but enduring fear. Some anxiety is natural, rational and useful in leading a person to deal constructively with the causes of his fears. But when the amount of anxiety becomes disproportionate to the situation and persists for a longer period than we refer it as neurotic anxiety.

2. Obsessive-compulsive reactions

An obsession may be defined as a recurring thought or desire that a person regards useless or false but cannot help. A compulsion is an irresistible tendency to perform some action. A person who is obsessed with an idea, finds himself unable to get rid of the idea. For example, there was a lady who got uprooted her teeth because of an incurable disease, and was obsessed with the idea of teeth for more than five years.

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The compulsive person knows that his actions are unnecessary and absurd but he cannot resist the temptation of doing those acts. There are technical terms for various kinds of compulsions. Some of them are as follows: Kleptomania (compulsion to steal); Pyromania (compulsion to set fire); Poromania (compulsion to move from place to place); Dipsomania (uncontrollable desire to drink); Nymphomania (excessive sexual desire in females).

Hypochondria

It is neurosis when a person, in anticipation of some failure, develops a tendency to be sick. Actually, the person is not sick but he pretends to be sick to avoid painful situation to maintain the balance of his personality. For example, a boy who feels that he will not pass in the examination, pretends to be sick on the eve of examination.

Psychotic adjustment mechanisms

A psychosis is any form of mental disturbance that is so severe as to make a person incapable of adjusting to his social environment. There are two types of psychotic disorders, which have been detected by clinicians. A brief description of the two types of psychotic disorders is as follows:

(1) **Organic psychoses:** There are different causes of organic psychoses but one common cause is damage to brain or interference with the functioning of the brain. The behaviour of a psychotic is characterized by the impairment of intellectual functions, sensori-motor disturbances such as aphasia, paralysis, deterioration of conduct, etc.

The main types of psychoses are as follows:

- (a) Infectious diseases as general paresis, encephalitis and meningitis
- (b) Psychotic disorders caused by brain tumour and head injuries
- (c) Psychotic disorders caused by toxic and metabolic disturbances
- (d) Epilepsies
- (e) Senile psychosis

(2) **Functional psychoses:** Functional psychoses are broadly classified into three classes: schizophrenia, paranoia and affective disorders.

(a) **Schizophrenia:** Schizophrenia was formerly known as dementia praecox. It is the most puzzling and serious disease. It is used for a wide variety of mental disorders characterized by disturbances of thought process, distortion of reality, delusion and hallucinations and the loss of integrated and controlled behaviour.

- (i) **Simple schizophrenia** is the preliminary stage marked by loss of interest, social withdrawal and flatness of emotional expression.
- (ii) **Catatonic:** Schizophrenia is, generally, marked by two patterns of behaviour: stupor and excitement.

(iii) **The hebephrenic:** The individual suffering from hebephrenic schizophrenia behaves like a child.

(iv) **Paranoid:** The patient sees delusions of being persecuted. He hallucinates as if he is being followed by someone, delusions of grandeur can also be seen.

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- (b) *Paranoia*: Paranoia is an intellectualized system of defences, which is characterized predominantly by delusions. Persons suffering from paranoia are hypersensitive. They maintain limited social functioning, have sufficient self-control and judgement to avoid hospitalization.
- (c) *Affective psychoses*: There are two major states of affective psychoses: manic state when the patient feels elated, extreme overactivity and tremendous energy. The second form is depressive reaction, which shows loss of enthusiasm and slowing down of physical and mental activity.

6.6 MALADJUSTMENT

There is a difference of degrees between maladjustment and adjustment. It is difficult to differentiate adjusted and maladjusted children only on the basis of observation in the classroom or in the school. There are certain symptoms, which give some indication of maladjustment if excessively used by children. These symptoms can be divided into the following three categories:

- 1. Physical symptoms:** Stuttering, stammering, scratching head, facial twitching, biting nails, rocking feet, restlessness, drumming with fingers and vomiting.
- 2. Behaviour deviations:** Aggression, lying, bullying, poor school achievement, hyperactivity, negativism and sex disturbances.
- 3. Emotional symptoms:** Excessive worry, fear, inferiority, hatred, extreme timidity, temper tantrum, persistent anxiety, conflicts and tension.

6.6.1 Detection of Maladjustment

Though the detection of maladjustment requires professional skills of a psychiatrist, which we cannot expect from a teacher, the teacher at the preliminary stage can help in detecting maladjustment in the following ways:

- 1. Observation and interview:** The teacher can observe the behaviour of children in the classroom, outside the classroom, on the playground, library and dramatics, etc. He can hold interview with those whom he suspects maladjusted and can reach definite conclusions regarding individual cases of maladjustment.
- 2. Use of tests:** There are a number of psychological tests, inventories and rating scales, which have been developed by psychologists to screen maladjusted children. The teacher may use any of the following tests to detect maladjustment:
 - (a) *Haggerty-Olson Wickman behaviour rating schedules*: It may be used to rate various traits of the behaviour.
 - (b) *The Bell adjustment inventory*: The teacher can use the Bells' Adjustment Inventory adopted to Indian conditions. The inventory measures the adjustment of an individual in major life situations such as home, physical, emotional, school and social situations.
 - (c) *The moony check-list*: The teacher, on the basis of observation, may find out maladjusted children in his class. He can use the check-list.
 - (d) *The Rogers' test of personality adjustment*: The teacher can also use the Rogers' test to screen adjusted and maladjusted children.
 - (e) *Taylor anxiety scale*: The scale may be used to screen children who have excessive anxiety. There is a great need for developing inventories or

Check Your Progress

5. Name the criteria evolved by psychologists to judge the adequacy of adjustment.
6. Name the types of compensation.
7. What was the former name of schizophrenia?

other measures that can screen adjusted and maladjusted children and adults in Indian conditions. The tests used at present were developed mostly in foreign countries where the socio-economic conditions are quite different from ours.

Maladjustment is a complex problem of human behaviour; no single factor can be pin-pointedly named as its cause. It is the outcome of various factors interacting with the developing personality of the child. There are numerous factors in home, society and school, which lead to maladjustment. The following are the various conditions which lead to frustration of needs which is the basic cause of maladjustment: 1. Physique; 2. Long sickness and injury; 3. Poverty; 4. Broken home; 5. Personal inadequacies; 6. Parental attitudes; 7. Value placed on sex of the child; 8. Adoption; 9. Emotional shock.

Social Conditions such as: 1. Religious beliefs; 2. Lack of clubs, playgrounds and libraries; 3. Mobility; 4. Class differences; 5. Employment insecurity

Maladjustment and conditions in school

No doubt, adjustment is a lifelong process starting from the birth of the child to his old age. A school can develop good habits, which may help in future adjustment of the child, but there are many conditions in school also, which may lead to maladjustment of children. The important conditions are as follows: 1. Inadequate training of teachers; 2. Inadequate curriculum; 3. Lack of recreational facilities; 4. Classroom climate; 5. Restrained relationship between administrator-teachers, teacher-teacher and student-teacher; 6. Examination system.

Defence Mechanisms

When the psychological equilibrium is threatened or there is a state of conflicts or frustration and an individual does not find any direct adjustment with the situation then the mind resorts to balancing devices called defence mechanisms. The individual is generally not fully aware of their presence or purpose. They are considered to be temporary defences against anxiety and inadequacies. We all want self-acceptance and acceptance of others. These devices try to defend the esteem, prestige and dignity of an individual against the encountered defeats and failures.

These devices are required in moderation and are frequently used by normal human beings. These mental mechanisms provide some relief when one is distressed. They preserve inner harmony and permit some degree of adaptation. They can be treated as shock absorbers and healthy adjustive mechanisms. In exaggerated form, however, they indicate abnormal behaviour.

According to Carroll, 'a defence mechanism is a device resorted to, in order to achieve an indirect satisfaction of a need so that tension will be reduced and self-respect maintained.'

Arkoff observes that the patterns of behaviour that are employed for protection against threat or anxiety are called defence mechanisms or adjustment mechanisms. Sometimes, they are referred to as ego defence mechanisms since they serve to defend the ego or the self from threat.

Thus, we can say that defence mechanisms are devices in the form of particular patterns of behaviour. These mechanisms provide protection against whatever threatens our self-esteem and ego. Some of the major defence mechanisms are as follows:

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1. **Apathy:** According to Page, 'apathy is more than absence of emotion. It is a positive attitude of indifference towards all experiences and situations. Events that normally evoke joy, grief, shame or sympathy have no effect upon the apathetic person. Apathy serves as an effective insulator against an uncongenial world and in certain cases may be a passive act of defiance or scorn.' This process of becoming apathetic is also called intellectualization. It means detachment from a situation which may be emotionally disturbing. For example, a doctor cannot get emotionally involved and attached with every person she examines and treats. She needs to be detached to perform her job properly.
 2. **Displacement:** Sometimes, the direct expression of an emotion is inhibited and the emotion is indirectly expressed through a neutral object. Thus, this transfer of emotions from the original to a neutral object is called displacement. A manager, when scolded by his boss, cannot talk back; the resulting anger or frustration is displaced upon and taken out on wife or children at home.
 3. **Stereotyping:** It is the tendency on the part of an individual to repeat similar behaviour in all situations and decision-making. It is believed that some amount of flexibility is required to solve different types of problems. When an individual becomes frustrated with solving problems, he or she tries to make similar efforts again and again.
 4. **Reality evasion:** This mental mechanism of reality evasion is the one in which an individual tries to escape the realities of life. Some people feel that they will be criticized by other people around them. They want to avoid and ignore their defects. Such kind of people resort to this type of mechanism, and often postpone the need to make difficult decisions. It may be due to lack of confidence or some physical problem. They also feel that they are not competent enough to live up to the expectations and are not intelligent enough to take the decisions. Thus, they evade reality and face the problems of adjustment.
 5. **Withdrawal:** Whenever one suspects that one is likely to be criticized, ridiculed or disgraced because of one's behaviour and activities, one may resort to withdrawal tendencies. These tendencies are reflected in the behaviour when one is extremely shy, solitude loving and has nervous temper. Such a person avoids all hard work and believes that he or she cannot perform particular types of activities. One may go so far as to hide or may be content merely by avoiding chances of pain, shame or frustration. Some people also avoid associating with people who are superior to them in any way.
 6. **Selective forgetting:** One simple way of avoiding pain or distressing circumstances is forgetting them. The forgetting is selective in nature. Many studies have concluded that painful experiences are forgotten sooner than soothing and pleasurable experiences. For example, we forget the promises that we do not want to remember or fulfill.
- Defence mechanisms also involve rationalization, projection, reacting formation, repression, Fantasy and day dreaming, regression, compensation, sublimation, negativism and identification.

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Problem Children

All teachers face the problem of those children who lag behind from other children in their school work. There are such children who deviate from their classmates in school achievement. They do not benefit from teaching in the class. The teacher can identify them by their facial features, inattention and their failure to respond simple questions in the class. These children are great liability for the society. The teachers, parents and social workers all are concerned with this typical group of children called backward or problem children. Backwardness may be of different types and is caused by multifactors.

Backwardness may be in physical, emotional, social and intellectual developments of an individual. As regards its causes, there is a constant struggle between the hereditarians and environmentalists claiming different causes of it. Generally, backward children are classified into two distinct categories—in one category, backwardness is determined on the basis of IQ of the child and in the other category, the backward child is treated in terms of his academic achievement in the school subjects. The first category is called mental retardation and the second category comes under educational retardation.

With the help of intelligence tests, we can understand the degree of backwardness. If we administer an intelligence test to a large portion of unselected population and plot the scores, the result is a smooth curve and IQ will range almost 25 to 200 and, generally, we classify children as follows:

1. Idiots = 0 to 25
2. Imbecile = 25 to 50
3. Morons = 50 to 75
4. Dull normal = 75 to 90

The backward child has the following problems:

1. A backward child has adjustment problems in regular classes. Generally, the assignments given to him either are too difficult or he has fallen too far behind his grade level to understand and perform the task required of him in regular classes.
2. He lacks the motivation to learn, either because his background has been too deprived, his home-induced emotional problems are too severe or his learning attempts have received no suitable encouragement or consistent reinforcement by the teacher.
3. He has become failure oriented because of repeated defeats and thus no longer believes himself capable of learning. He fears failure and lacks ability and confidence to initiate new activities.
4. The material, he is assigned, has not been made meaningful to him, so he sees little purpose in learning it.
5. He is flooded with anxiety produced by the defences he has created against self-devaluation.
6. He is bitter and hostile towards school and society because of the humiliation he has suffered. The school environment provides him no motivation to work.

Check Your Progress

8. List the emotional symptoms that depict maladjustment.
9. Define apathy.
10. What is 'stereotyping'?

6.7 INCLUSIVE EDUCATION

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Inclusion in education is an approach to educate students with special educational needs. Under this model, students with special needs interact and spend time with non-disabled students. Implementation of these practices varies. Schools usually use them for selected students with mild to severe special needs.

Inclusive education is different from the previously held notions of integration and mainstreaming, which was mainly concerned with disability and 'special educational needs'. This implied that learners change or become 'ready for' to get accommodated in the mainstream. Inclusion in fact is about a child's right to participate and the duty of a school to accept the child. Inclusion rejects the use of special schools or classrooms for students with disabilities and to differentiate them with students without disability. A premium is placed upon full participation by students with disabilities and upon respect for their social, civil, and educational rights. Inclusion gives students with disabilities skills they can use in and out of the classroom.

- Inclusion is an effort to make sure that diverse learners—those with disabilities, different languages and cultures, different homes and family lives, different interests and ways of learning—are exposed to teaching strategies that reach them as individual learners.
- Inclusive schools ask teachers to provide appropriate individualized supports and services to all students without the stigmatization that comes with separation.
- Teachers in inclusive classrooms vary their styles to enhance learning for all students.

The purpose of education is to ensure that all students gain access to knowledge, skills, and information that will prepare them to contribute to America's communities and workplaces. The central purpose becomes more challenging as schools accommodate students with increasingly diverse backgrounds and abilities. As we strive to meet these challenges, the involvement and cooperation of educators, parents, and community leaders is vital for the creation of better and more inclusive schools.

Inclusion is an educational approach and philosophy that provides all students with community membership and greater opportunities for academic and social achievement. Inclusion is about making sure that each and every student feels welcome and that their unique needs and learning styles are attended to and valued.

Fully inclusive schools, though rare to find, does not distinguish between 'general education' and 'special educational' programmes. Instead, the school is restructured so that all students learn together.

Inclusion has two sub-types:

- Regular inclusion or partial inclusion
- Full inclusion

Inclusive practice is basically integration. For example, students with special needs are educated in regular classes throughout the day or at least for more than half of the day. Whenever possible, the students receive additional help or special instruction in the general classroom. At the same time the student is treated like a full member of the class. At the same time most specialized services are provided outside regular classroom, particularly if special equipment is required or if it disturbs the rest of the class (such as speech therapy). In such circumstances the students occasionally leave

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the regular classrooms to attend smaller and more intensive instructional sessions or other related services, such as speech and language therapy, occupational or physical therapy and social work.

In the 'full inclusion' setting, the students with special needs are educated alongside students without special needs. Some educators are of the view that this method might be more effective for the students with special needs. Full inclusion is the integration of all students, even those that require substantial educational and behavioural support and services to be successful in regular classes. Special education is considered a service, which are integrated into the daily routines of the classrooms, environment, curriculum and strategies and offered to the students, instead of removing the student to meet his or her individual needs. However, this approach to full inclusion is somewhat controversial, and it is not widely understood or applied to date.

Local educational agencies provide a number of settings from special classrooms to mainstream inclusion and help students to achieve his or her individual educational goals. Students with mild or moderate disabilities, as well as disabilities that do not affect academic achievement, such as using wheelchair are most likely to be fully included. However, students with all types of disabilities have been successfully included in general education classes, working and achieving their individual educational goals in regular school environments and activities.

Students with disabilities who are not included are typically either mainstreamed or segregated. A student who is differently disabled attends some general education classes for less than half the day and often for less academically rigorous classes. For example, a young student with intellectual disability might attend physical education classes, art classes and storybook time, but spend reading and mathematics classes with other students with similar disabilities.

The proportion of students with disabilities who are included in the mainstream varies by place and by type of disability. Students with milder disabilities are included more than those with certain kinds of severe disabilities. In Denmark, 99 per cent of students with learning disabilities like dyslexia are placed in general education classrooms. In the United States, three out of five students with learning disabilities spend majority of their time in the general education classroom.

At no time does inclusion require the classroom curriculum, or the academic expectations, to be watered down. On the contrary, inclusion enhances learning for students, both with and without special needs. Students learn, and use their learning differently; the goal is to provide all students with the instruction they need to succeed as learners and achieve high standards, alongside their friends and neighbours.

ACTIVITY

Write a comparative note on the personality theories discussed in this unit.
You may research on the Internet.

DID YOU KNOW

High self-esteem people are very friendly, affectionate, find it easy to form interpersonal attachment and find good in other people.

6.8 SUMMARY

In this unit, you have learnt that:

- Personality is considered to be a set of characteristics that are stable and do not change either over a period of time or from situation to situation. These characteristics account for consistent pattern of behaviour. It is the stability of these characteristics that sometimes assists us in predicting behaviour of a given person.
- Psychoanalytical theory is based upon Freudian concept of personality being founded on unconscious framework of id, ego and superego where id is the unconscious animalistic urge to seek pleasures at any cost and ego and superego keep id in check through social and moral values. Depending upon the strength of ego and super ego, some personality traits can be identified.
- The trait theory of personality describes people on the basis of traits such as aggressive, flexible, humorous, sensitive, sentimental, impulsive and so on. By observing some of these traits, we may be able to identify a personality.
- The self-concept theory of personality promotes the idea that a person's behaviour reflects his own image about himself. For example, a known flirt is expected to flirt in social situations.
- The social learning theory of personality is based upon the premise that personality development is more a result of social variables than biological drives or unconscious desires. Accordingly, personality is a sum total of all that a person has learned so that the learning process can be manipulated to develop or change a personality.
- From the point of view of psychoanalysis, early childhood experiences are very important for the future development of personality.
- According to Barney and Lehner, frustration refers to a failure to satisfy a basic need because of either conditions or external obstacles.
- A major source of frustration is conflict. The cause of conflict can be two desires or two types of behaviours, which are not compatible with one another.
- If the conflict is not too severe and the consequences are not very serious then it can be easily ignored.
- Business, military, education and other social activities need efficient and well-adjusted men for the progress of the nation.
- There are some common ways, which the individuals use to defend or escape from conflicts and frustration. These are known as defense or adjustment mechanisms.
- Rationalization has been defined as a mechanism by which the individual justifies his beliefs and actions by giving reasons other than those, which activated or motivated him.
- Inclusion is an educational approach and philosophy that provides all students with community membership and greater opportunities for academic and social achievement. Inclusion is about making sure that each and every student feels welcome and that their unique needs and learning styles are attended to and valued.

6.9 KEY TERMS

- **Conflict:** The inner state of mind, which is characterized by tension because of the presence of mutually exclusive or opposing tendencies/impulses or desires, at the same time
- **Frustration:** The outcome of obstacles in the path of an individual's goal or objective
- **Mental health:** Refers to the level of cognitive or emotional well-being of a person
- **Neurotic behaviour:** It is the behaviour that deviates from conventional ways of responding
- **Obsession:** It is recurring thought or desire that a person regards useless or false but cannot help
- **Psychoanalytical theory of personality:** Behaviour has been based primarily on the Freudian concept of unconscious nature of personality
- **Self-esteem:** A measure of self-confidence and respect for one's abilities and motivation
- **Trait theory:** Visualizes personality as a reflection of certain traits of the individual

6.10 ANSWERS TO 'CHECK YOUR PROGRESS'

1. Trait theory visualizes personality as a reflection of certain traits of the individual. Even though there are many traits that are common to most people, there are many other traits that are unique to a person and are not shared by other individuals. On the basis of the traits theory, people can be described as aggressive, loyal, pleasant, flexible, humorous, sentimental, impulsive, cool and so on. Traits are the basic elements of personality and can be used to summarize behaviour. For example, if we see people behaving in an extrovert and forceful manner in most situations, we could label their personality as aggressive. While social learning theory uses "reinforcement and punishment" approach in understanding personality. For example, frustration caused by external environment, causes and reinforces aggression as a personality trait. Also, good behaviour is rewarded by the society in terms of praise that further reinforces good behaviour. Thus, behaviour and external environment have mutual interaction.
2. Each generation transmits the acquired skills and knowledge to the succeeding generations. Cells carry all the characteristics of a potential child. This is called the biological heredity of the child. Genes, the carriers of human traits, are of two types; dominant and recessive. Genes occurring in paired positions along the chromosomes carry contributions toward the same characteristics but can give information of development. Culture refers to total life activities of a society. What people think or do and feel constitute the culture of a society. It is the physical way of life, social institutions and psychology of the people fused together. Biological inheritance is the same in human beings all over the world but it is the difference in their cultural conditions which develops distinctive personality characteristics in the individuals of different cultural groups.

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3. A situation in which a child may have a conflict if he or she cannot decide whether to go to the zoo or play with friends is an example of the approach-approach type of conflict.
4. The common reactions to conflict are as follows: (i) restlessness and tension, (ii) aggression, and (iii) anxiety.
5. Psychologists have evolved the following criteria to judge the adequacy of adjustment:
 - Physical health
 - Psychological health
 - Work efficiency
 - Social acceptance
6. The following are the different types of compensation:
 - Direct compensation
 - Over compensation
 - Substitute compensation
 - Indirect compensation
 - Neurotic compensation
7. Schizophrenia was formerly known as dementia praecox.
8. Emotional symptoms such as excessive worry, fear, inferiority, hatred, extreme timidity, temper tantrum, persistent anxiety, conflicts and tension depict maladjustment.
9. Apathy means detachment from a situation, which may be emotionally disturbing.
10. Stereotyping is the tendency on the part of an individual to repeat similar behaviour in all situations and decision-making.

6.11 QUESTIONS AND EXERCISES

Short-Answer Questions

1. Define 'personality'. What are the specific traits that constitute the concept of personality?
2. What are the primary hereditary factors that contribute towards formation of personality? How can we be sure that all such factors are hereditary in nature?
3. How is mental health of teacher critical in the mental health of students?
4. How is adjustment as achievement different from adjustment as process?
5. List the causes of maladjustment.
6. Write notes on the following terms:
 - Stereotyping
 - Withdrawal
 - Selective forgetting

Long-Answer Questions

1. Describe in detail the psychoanalytical theory of personality. Is this theory empirically verifiable? Support your reasons.

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2. How does trait theory of personality differ from social learning theory? Can some of the traits be socially learned?
3. Explain in detail some of the environmental factors that form a part of the personality. Can a change in these factors change the personality as well? Support your reasons.
4. Write a short note on the concept of 'inclusive education'.

6.12 FURTHER READING

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PART B: PRACTICAL

UNIT 7 TEST ADMINISTRATION AND INTERPRETATION

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- 7.1 Unit Objectives
- 7.2 Performance Tests of Intelligence
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 - 7.5.3 Determinants of Attitude and Attitude Testing
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7.0 INTRODUCTION

Sometimes, we take the three concepts like 'aptitude', 'skill', and 'proficiency' as synonymous. But there is difference between these. From intelligence test, we cannot judge the aptitude of an individual because intelligence is a general ability whereas aptitude is a specific ability. So, when we predict the future of an individual, we should go for aptitude testing rather than intelligence testing. Interest and aptitude both have positive correlation but it does not mean that attitude and interest are same things. An individual with interest and aptitude for teaching profession will get success in life, but if only interest is present without aptitude the question of success will arise.

Human behaviour is a reflection of psychological traits. A person's behaviour determines his personality, and personality is the expression of his attitude, aptitude, intelligence, motivation, interest etc. The person's success in life is mostly determined by his interest in it. Interest includes all the psycho-physical dispositions which distinguishes an individual from another individual. One's interest determines his educational and vocational achievement, utilization of leisure hours, interaction with the society and interpersonal relations.

In this unit, we will discuss the various aspects of test administration and administration.

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7.1 UNIT OBJECTIVES

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

- Explain the uses of aptitude test
- Compare the individuals of different aptitude on the basis of their academic and occupational success
- Identify the aptitude of a group of people
- Diagnose the factors affecting aptitude
- Learn the concept of personality test
- Describe the significance of attitude scale

7.2 PERFORMANCE TESTS OF INTELLIGENCE

A performance test is one in which the subject has to perform something or to manipulate some concrete material without much use of the language ability. There are some categories of people and children who cannot be tested with the help of verbal tests of intelligence. Performance tests are similar to non-verbal tests of intelligence. Performance tests are useful for the following categories of children and people:

1. *Deaf and dumb*: Children or people, who cannot hear or speak, can be tested with the help of performance tests. The directions can be given in Pantomime with a minimum use of language.
2. *Illiterates*: Illiterate adults and children who cannot write or whose language development is deficient may be tested with the help of performance tests of intelligence.
3. *Shy and withdrawn children*: Children who are shy or fear for face to face interaction with the tester may be tested.
4. *Educationally deficient*: Children who are educationally deficient take interest in concrete material and its manipulation can be tested.
5. *Foreign children*: Children of foreign countries who do not understand the language may be tested with performance tests.

Generally, performance tests are used to supplement other tests of intelligence. Performance tests provide more reliable data for an individual's capabilities. They are more useful in clinical work. These tests provide an opportunity for close observation of the behaviour of testee in test situation and his method of solving problems.

7.2.1 Some Performance Tests

1. *Healy-Fernald group of tests*: It was the first measuring tool to test the intelligence by performance.
2. *The Pintner-Paterson scale*: This performance scale is the first organized scale. This scale was standardized in 1917. It consists of Healy-Fernald performance tests and several other tests developed by earlier psychologists. The scale includes fifteen sub-tests. The tests are administered without the use of language either by the examiner or examinee. The tests are useful for deaf, dumb and

those who lack in language ability. They have been found very valuable supplement to verbal tests of intelligence.

3. *Form boards*: There are several performance tests in which form boards are used. The Ferguson form board was developed in 1920 and revised in 1939. It consists of six form boards which increase in difficulty. These tests were standardized on children and college seniors who had some educational problems. They are currently used for children who come for clinical guidance.
4. *The Kent-Shaknow form board series*: This performance scale was developed in 1928. It is a widely used and known scale. It has two forms. One for clinical use and the other for industrial use. Basically, the scale was developed and standardized on clinical population. The scale provides an insight into the analytic-synthetic and manipulative skills of the subject. It also provides close observation of the behaviour of the subject and his mode of tackling a problem.
5. *The Goodenough drawing test*: This test was developed by Florence Goodenough in 1926. It is the most widely used test to measure the intelligence of children from 3½ to 13½ years. The child is asked to draw a picture of a man as best as he can, without any time limit. 'Draw a man' is a very popular test of intelligence. It requires no training and no specific material for administration. It has been adopted in Indian conditions by several research workers. This test is a useful device as an adjunct to verbal tests when mental retardation in children is suspected.

Advantages of Performance Tests

- Performance scales are most useful with older children and adults who are mentally retarded. They have clinical significance in case of older children.
- Since the performance tests do not require use of language, individuals do not 'block' as a result of feeling of inadequacy resulting from lack of schooling.
- Children proceed on performance tests with confidence, since the material is visually present in a concrete form. Performance tests provide an opportunity to observe the qualitative aspect of behaviour of the individual under standardized condition in a variety of test situations.
- Performance scales are useful and provide valuable information when supplemented with verbal tests of intelligence.
- They are useful for those with language handicap.

Disadvantages of Performance Tests

1. Performance scales are more susceptible to practice effect and chance success is more frequent than in verbal tests. Hence their reliability co-efficient is low.
2. They are limited in range of mental functioning tested. They fail to differentiate among above-average children.
3. The conventional performance scales fail to test fine mental abilities such as ability to make abstraction or concept formation.

7.2.2 Uses of Intelligence Tests

1. *For measuring general learning readiness*: We know that intelligence tests are correlated with school achievement so intelligence tests can be used to indicate the level of capacity at which the pupil has arrived. Numerous

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investigations have been made to discover the relationship between intelligence tests and school marks at different levels of schooling. All researches have proved, beyond doubt, that intelligence tests can be used to measure the readiness for learning at different levels.

2. *For indicating the extent of differences of IQ among the children of same chronological age:* There are great differences in IQ of pupils of same age. These differences indicate the need for providing teaching materials at differing levels of difficulty. At various levels of education, we can use the tests for educational guidance, i.e., we can advise students to select subjects keeping into consideration their intellectual abilities.
3. *Defining more accurately the degree of mental retardation or defect:* Since the development of intelligence tests, we have been using intelligence tests to define more accurately the levels of feeble-mindedness. Using the intelligence tests we may define the level of feeble-mindedness.

Level	IQ
1. Idiot	20
2. Imbecile	20 to 40
3. Moron	40 to 65

We can classify children weak in mind so that proper arrangement can be made for their schooling. It is intelligence test that can aid us in knowing just which children will probably remain in the special class.

4. *For identifying gifted children:* Since 1921, when Terman used both individual and group tests of intelligence to identify the gifted, intelligence tests have been used for this purpose. Tests of intelligence have given us an accurate definition of brightness in terms of IQ. Teacher's judgement has been found inaccurate in identifying gifted children as reported by Terman, Whipple and Coy in their separate studies of gifted children.
5. *For educational and vocational guidance:* The essence of educational guidance resides in providing for all children materials for instruction both interesting in content and suitable to their level of intellectual development. When we contemplate the magnitude of individual differences, psychological testing can be very useful in ensuring that children's educational progress is in accord with their abilities and can be helpful in discovering those children who need vocational guidance. Vocational guidance means finding the right man for the job. Tests can be used to provide vocational guidance at different age levels in various vocations. At present in our country vocational guidance is not adequately provided. It is unfortunate that we have not yet developed a system of sound vocational guidance services. We need to develop intelligence tests, interests and aptitude tests suiting to the needs of our country. The vocational guidance programme will have considerable social consequences in our country which is developing socially, economically and technologically.

For making decisions about going to college, intelligence tests can be used to predict the subsequent success of high school or inter-college students. Teachers can use intelligence tests to make decision for individual students regarding their success in college or university.

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6. *For study of mental growth:* Mental abilities develop in a sequential order from birth onward. We can use intelligence tests for studying mental growth and direction of individual and group curve.

Intelligence tests have made it clear that the mental development of children is a steady consistent process from one year to the next. Use of intelligence test in consecutive measurement has thrown the old idea that there are periods of rapid mental growth at the time of adolescence followed by periods of slow growth. Mental growth continues until at least 18 years of age.

7. *For homogeneous grouping:* Teachers, in the past, have experienced great difficulties inherent in attempting to teach pupils or students who are widely different in their capacities to learn. In average classroom, bright and dull children are the losers. As remedy to the problems of traditional classroom, homogeneous grouping of students has been suggested and tried out in many schools of western countries with encouraging results with the help of intelligence tests.
8. *Use in research:* Intelligence tests are used for conducting research in different areas of human abilities.

7.2.3 Limitations of Intelligence Tests

We know that in India very few tests have been developed or standardized. Generally, we use tests developed in foreign countries.

An intelligence test permits a person to show what he can do at a certain time with a certain carefully selected, but small, set taken from all the possible items which test intelligence. No one should suppose that this small set can tell as much about him as if 100 times as many items were available. Nonetheless, it tells a great deal and inordinate increase in length of tests, suffer the usual consequences of the law of diminishing return. Similarly, we know that one person may be more fatigued than another when we take the test, possibly reducing his scores. They tell us what a person can do right now, handicapped or favoured as he may be by his inherited characteristics, his home and school background, better sensorimotor or bodily states. They do not tell us how he would have done if tested ten years ago or if tested ten years hence, with or without ideal conditions during those ten years. Consequently, it is always possible to second-guess such a test and conclude that it does not tell what we really want to know.

Jensen reports that he has often had cause to believe that the first intelligence tests given to certain children underestimate their IQ after 2 to 4 days of getting acquainted with such children. He typically found that a retest on a different form of the same test yielded an IQ of 8 to 10 points higher. Children may be so frightened in a testing situation with a tester they are unfamiliar with and when confronted with tasks that are completely novel that they do not exhibit nearly the intellectual capacity one would expect from other evidence about them. Particularly with young children, it would be important to spend much more time-building rapport for testing than few minutes that are sometime employed before formal testing begins.

One of the major defects of present-day testing is that, it is unable to get below the surface of the mind. It measures what a child knows rather than how far he can go in the pursuit and discovery of ideas. It has almost no bearing on originality, on the mobilization of many ideas toward a single concept or on the ability to devote his attention over a period of time to a single line of thought. A smattering of knowledge in many fields will lead to a score equal to that of the child who could do marvellously

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well along certain lines, but whose accredited performance is cut off far below his mental levels. For example, a child with a 30,000 words vocabulary can scarcely get more mental credit than a child with 10,000 words vocabulary, although the differences in mental accomplishment are tremendous.

7.2.4 Some Misconceptions Regarding Use of Intelligence Tests in Education

The following are the misconceptions regarding the use of intelligence tests in education:

1. The first misconception is the notion that intelligence tests measure something called 'native ability,' something fixed and immutable within the individual that determines his level of expectation for all time. No doubt, genetic studies of identical twins reared separately under different conditions have proved that an individual inherits intellectual abilities, but intelligence tests do not measure such an entity, at least not directly. Intelligence tests measure the individual's performance on certain type of mental tasks. The types of mental tasks included in intelligence tests are influenced by experiences in school and home. The experiences depend on many factors as the education of parents, availability of books in home, socio-economic condition and a variety of experiences the child gets in his surroundings. Thus, the notion that intelligence tests measure inherent ability is absurd.
2. The second misconception about intelligence tests is the notion that prediction made from test scores is or should be perfectly accurate.
3. The third misconception is that standardized test scores are perfectly reliable.
4. The fourth misconception regarding intelligence tests is that a battery of tests can tell all one needs to know in making a judgement about a student's competence, present and potential, and about his effectiveness as a human being. The fact is otherwise that no test or battery of tests can give a total picture of a child. No doubt, tests can illuminate many areas of a child's development. They can suggest something about his strengths and weaknesses. They can show in certain respects, how he stands among his peers. But there are many areas of learning where we must still rely upon the observation and judgement of teachers if we want to get a complete description of a child as functioning individual. Any evaluation of a child that depends solely on mental test scores is bound to be misleading and incomplete. There are subtle and supremely important human elements in the teaching-learning situation that no combination of tests devised till date is able to capture.

7.3 APTITUDE AND APTITUDE TEST

Bingham defined aptitude as 'a characteristic or set of conditions that are symptomatic to the individual's ability to acquire with some specified training, some knowledge or skill or a set of responses in a given field'. Aptitude refers to a special capability of an individual, which makes him distinct from others in an achievement field. It signifies the potentialities with an individual at present with future predictive reference. The word 'aptitude' is derived from the Latin word 'aptos' which means 'fitted for'. Aptitude of an individual towards some work fits him in the work like round peg in

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the round hole and square peg in the square hole. The concept of aptitude does not have the good or bad value judgment. It only bothers about the degree of aptitude like high aptitude or low aptitude. It just means that an individual fits into the requirements of one profession better than into another. For example, Kavita performs well in singing without any formal training, but after a rigorous training she does not perform well in teaching profession. So, here Kavita has higher degree of aptitude in singing than teaching.

Traxler states: 'Aptitude is a condition, a quality or a set of qualities in an individual which is indicative of the probable extent to which he will be able to acquire under suitable training, some knowledge, skill or composite of knowledge, understanding and skill, such as ability to contribute to art or music, mechanical ability, mathematical ability or ability to read and speak a foreign language.' Freeman stated that 'an aptitude is a combination of characteristics indicative of an individual's capacity to acquire (with training) some specific knowledge, skill or set of organized responses, such as the ability to speak a language, to become a musician to do mechanical work'. According to Warren, 'aptitude is defined as a condition or set of characteristics regarded as symptomatic of an individual's ability to acquire with training some specified knowledge, skill or set of responses such as the ability to speak language, to produce music etc'.

7.3.1 Characteristics of Aptitude

The characteristics of aptitude are as follows:

- Aptitude is an ability to learn.
- Aptitude is an integral part of personality.
- Degree of aptitude determines one's success in particular work.
- Aptitude predicts the future of an individual.
- Aptitude is a present condition with a future reference.
- Aptitude is the product of heredity and environment.
- Aptitude of an individual is relatively stable.
- There is inter- and intra-individual difference in aptitude.
- An aptitude must be developed by practice and training to become an ability.
- Aptitudes are normally distributed.
- Aptitude can be measured quantitatively and qualitatively.

7.3.2 Types of Aptitude

There is individual difference in aptitude. Everybody has different kinds of aptitude. Two individuals may have aptitude of one kind but the degree of aptitude will be different. So there are different kinds of aptitude which are:

- Mechanical aptitude
- Clerical aptitude
- Aptitude in music
- Aptitude in law
- Teaching aptitude
- Aptitude in medicine

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- Aptitude in art
- Aptitude in science
- Aptitude in engineering
- Manual aptitude
- Aptitude for military career
- Aptitude for research

7.3.3 Aptitude Test

According to F.S. Freeman, 'an aptitude test is one designed to measure a person's potential ability in an activity of a specialized kind and within a restricted range'. Aptitude of an individual can be measured with the administration of test. Aptitude tests measure the ability of individual's to learn new tasks. Aptitude tests assess the degree of an individual's inclination towards something. Aptitude tests help the individuals in their selection of courses and careers. These tests are also helpful in provision of guidance and counselling and predicting the future development of an individual. An aptitude test of high validity, reliability and objectivity clearly predicts an individual's future.

Types of aptitude tests

Aptitude tests are divided into three types according to their quality of testing. The three types are:

(i) **General Aptitude Tests (GATs):** General aptitude tests are also known as scholastic aptitude tests. GATs measures the general intelligence, mental ability and learning ability of individuals. This type of test predicts the future progress of an individual to a lesser extent. This test is known as scholastic aptitude test because it predicts student's academic achievements in schools. This type of test is divided into four types:

- (a) Tests of vision and hearing
- (b) Tests of reading and writing
- (c) Tests of remembering and forgetting
- (d) Tests of understanding

Minnesota Paper-Form Board is a good example of General Aptitude Test.

(ii) **Specified Aptitude Tests (SATs):** This type of tests generally concentrates upon the assessment of an individual's ability in a special field. Through this test, an individual's area of special aptitude is known with the degree or level. Upon the result of this test, students are given educational and vocational guidance. Mechanical aptitude tests, musical aptitude tests, teaching aptitude tests etc., come under specified aptitude tests. Seashore Measures of Musical Talent and Horn Art Aptitude Inventory are good examples of Specified Aptitude Tests.

(iii) **Differentiated Aptitude Tests (DATs):** Differential Aptitude Tests are developed for measuring the fundamental intellectual abilities within individuals. The first edition of the DAT battery was published after World War II, by the Psychological Corporation.

The widely used Differentiated Aptitude Tests are: Armed Services Vocational Aptitude Battery (ASVAB), General Aptitude Test Battery (GATB), Aptitude Classification Tests (ACT) etc. The most important DAT is developed by American Psychological Corporation. The battery of tests developed by Bennett Seashore and Wesman under GAT are given below:

- Verbal Reasoning Tests of 30 minutes.
- Language-spelling and Sentences Test of 35 minutes.
- Clerical Speed and Accuracy Test of 6 minutes.
- Numerical Ability Test of 30 minutes.
- Abstract Reasoning Test of 30 minutes.
- Mechanical Reasoning Test of 30 minutes.
- Space Relation Test of 30 minutes.

Let us explain some of the important aptitude tests with their widely used tests.

(a) **Mechanical Aptitude Tests:** Mechanical aptitude of an individual refers to his psychomotor activities. It involves manipulation of objects and tools with a mechanical bent of mind. According to Bingham, factors in mechanical success are space relations, mechanical comprehension, perceptual acuity, and manual dexterity. Engineers and machine designers have high levels of mechanical aptitude. Persons having high degree of mechanical aptitude get success in engineering than the others. In this field, machinists or technicians are at the lower ebb and engineers at the higher ebb. Some widely used mechanical aptitude tests are:

- Bennet Tests of Mechanical Comprehension
- S.R.A. Mechanical aptitude test
- Minnesota mechanical assembly tests
- Stenquist mechanical aptitude tests I and II
- Sharma's mechanical aptitude test battery
- Jayendra's mechanical aptitude test

(b) **Clerical Aptitude Tests:** According to Bingham, clerical aptitude also involves several specific abilities like perceptual ability, intellectual ability and motor ability. In the words of Super, clerical aptitude refers to 'the ability of routine clerical work'. According to Bills, 'Clerical aptitude includes the gathering, classification, and presentation of data of all sorts, analysis and use of these data in planning, executing and determining the results of operation'. Clerical aptitude includes noting, drafting, continuous routine work, knowledge of language, perceptual speed and accuracy, arithmetical calculations etc. Some widely used clerical aptitude tests are:

- Minnesota clerical aptitude tests.
- Detroit clerical aptitude examination.
- A test of clerical aptitude by T.P. Lele and others.
- A battery of clerical aptitude tests by Kiran Gupta.
- Clerical ability test by Central Bureau of Educational and Vocational Guidance, Delhi.

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(c) *Teaching Aptitude Tests*: Teaching aptitude of an individual is known by his interest in communication interaction, expression, creativity, listening, speaking, reading, writing, imagination, interest in both curricular and co-curricular activities, research bent of mind etc. A person of high teaching aptitude becomes a good teacher. Some important teaching aptitude tests are:

- Teaching aptitude test by R.P. Singh and S.N. Sharma.
- Teaching aptitude test by Jai Prakash and R.P. Srivastava.

(d) *Tests of Scholastic and Professional Aptitudes*: In order to set the students in right place, some tests are developed. These tests help in the selection of students for admission to different academic and professional courses like MBA, MCA, Medical, Engineering, etc.

Some of the tests of scholastic and professional aptitudes are:

- Minnesota engineering analogical test
- Stanford scientific aptitude test by D.L. Zyve
- The American Council of Education Scholastic aptitude test

(e) *Scientific Aptitude Tests*: Scientific aptitude refers to the aptitude in deduction, induction, analysis, synthesis, judgment, understanding, logical thinking, convergent and divergent thinking etc. A scientist always looks a thing from scientific angle. The falling down of apple from the tree towards the earth is a general concept for a common man, but Newton's scientific attitude helped him to think about it which resulted in the gravitational force of earth. Men of scientific aptitude are very much creative. In order to assess the scientific aptitude, the tests used are:

- K.K. Aggarwal's Scientific Aptitude Test battery.
- Scientific Knowledge and Aptitude Test by S.Chatterjee and M. Mukherjee.
- Science Aptitude Test, Department of Science Education, NIE.

(f) *Musical Aptitude Tests*: Musical aptitude refers to the aptitude for singing, playing musical instrument, listening music etc. For success in the musical profession, a couple of things are necessary like manual skill in playing instrument, clear and sweet voice, creative imagination, emotion for music, knowledge of rhythms, etc. Renowned musicians have high degree of musical aptitude. Some examples of musical aptitude tests are:

- Seashore Measure of Musical Talent.
- Lundin's Battery of Five Tests.
- The Wing Standardized Tests of Musical Intelligence.

All the tests include Chord analysis, Melodic transposition, Pitch change, Rhythmic accent, Phrasing, Loudness, Tonal memory etc.

Merits of aptitude tests

Aptitude test has the underlined uses:

- It helps in providing guidance and counselling to the students.
- It helps the students in selection of their career and profession.

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- It helps in admitting candidates for various types of academic and professional courses.
- It properly anticipates the future progress of an individual.
- It helps the students in development of special traits.
- It helps the students to become efficient personnel in their working field.
- It helps to diagnose the inter- and intra-individual difference.

7.4 PERSONALITY TEST

The purposes of assessment of personality are as follows:

1. To appraise the status of and changes in pupil's personality development.
2. To find out pupil's needs and possibilities of development.
3. To aid student-teacher planning.
4. To familiarize the teacher with the nature of pupil learning, development and progress.
5. To serve as a means of improving school-community relations.
6. To facilitate the selection and improvement of assessment instruments
7. To appraise the teacher's competence.
8. To serve as a guiding principle for the selection and application of supervisory techniques.

Several difficulties are encountered in the assessment of personality. Although for long psychologists have been trying to develop sound techniques for measuring personality yet even to day they are far away from this goal.

There are three basic reasons for not arriving at exact conclusions.

- Complex nature of the individual whose personality is to be assessed.
- Complex nature of the person who assesses personality.
- Nature of assessment instruments.

1. **Complex nature of the personality of the individual**: The personality of the individual being assessed is very complex. We may peep into the child's personality here and there in some detail but a total peep of the personality eludes us.

Assessment of personality does not remain stable because an individual is ever growing and he may not respond to the same situation in the same manner. There are several internal and external forces which influence him constantly.

An individual who is being assessed is capable of employing hundreds of ways to evade being assessed. Even if he cooperates willingly with the best of his intentions, he may be unable to tell about the elements hidden in his unconscious mind.

2. **Complex nature of the assessor of personality**: Subjectivity of the person who assesses can also influence assessment. Even when the same person assesses the same individual at different intervals under the same conditions, results may differ. It is also observed that when two or more persons assess the same person, results may not be identical.

Check Your Progress

1. What is 'aptitude'?
2. State three important types of aptitude.
3. What are the types of aptitude tests?

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3. **Nature of assessment instruments:** In measuring a piece of cloth, we can use units in terms of centimetres and inches. In measuring temperature, we have units in terms of degrees and so on but in psychological measurement, we do not have any regular unit of measurement. In personality assessment there is no starting point (zero) for reference. No child is born with zero personality. This also creates difficulties in the exact assessment of personality. Above all, tools of assessment of personality are not very exact, reliable and valid in terms of their results

7.4.1 Experimental Techniques

This method has helped in contributing to the theory of personality and perception. The controlled conditions in the laboratory have made it possible to study the person under conditions of stress in the laboratory leading to greater understanding of factors that lead to disorganization and breakdown.

1. Autobiography method

In this method, the child gives an account of his life experiences from early childhood to the date of writing. This method helps the teacher or the counsellor to have a glimpse of the student's personality structure, his way of thinking, his likes and dislikes. This method also gives evidence of the instructional achievement of the child. Further, this method encourages the student to read autobiographies of great persons. The method allows the writer freedom of expression, not found in certain other techniques.

While reviewing the past, a child builds his self-concepts and tries to increase his self-insight and thinks of ways and means in which he can develop himself. All these are found to be very Useful for assessing his personality.

Autobiographies provide data which can be compared with those gathered by other means. This method is very economical. The teacher or the counsellor can obtain autobiographies of the students in groups at a minimum expenditure of his time.

The autobiographies yield much evidence of the child in adjustment and aptitudes. The autobiography is a tension-releaser. It serves as a 'catharsis' or psychic safety valve' and allows the child to express his pent-up feelings.

Principles of using the autobiography method are as follows:

- Rapport with the student should be established so that the child expresses his feelings freely.
- He should be ensured that the information supplied would be kept confidential.
- Detailed instructions may be given to the child as to the way in which autobiography is to be written.
- Questions may be given to the child so that he may reveal his history.

Limitations of the autobiography method are as follows:

- Its scope is limited and it cannot be used when the child is unable to express himself correctly in speech.
- The student may present facts in a distorted way.

2. Anecdotal Method

An anecdotal is a running description of actual examples of behaviour of a student as observed by teachers and the counsellor. It is followed by comments.

According to Brown and Martin, 'anecdotes are descriptive accounts of episodes or occurrences in the daily life of the student'.

It has been defined by Randall as a record of some significant item of conduct, a record of an episode in the life of the student; a word picture of the student in action, a word snapshot at the moment of the incident; any narration of events in which the student takes such a part as to reveal something which may be significant about his personality.

Raths Louis thinks that "an anecdotal record is a report of a significant episode in the life of a student."

Traxler thinks, "This record, as the name implies, involves setting down an anecdote concerning some aspect of pupil behaviour which seems significant to the observer."

Zann, D. Willard regards an anecdotal record "as a simple statement of an incident deemed by the observer to be significant with respect to a given pupil."

A Specimen of an Anecdotal Record

Name of the school _____

Name of pupil observed _____

Class ____ Subject ____

Observer _____

Date and Place _____

Objective Description _____

Comments of the Observer _____

Objective Description. I have been finding Ram day after day in the library reading magazines, yet he never has time to correct error or to work carefully on Hindi assignments.

Comment. Ram does not like to write but likes to read. I have asked the librarian not to admit him during his free periods unless he hears from me that Ram has done his work.

We cannot set any limit on the number of anecdotes to be recorded. It depends upon the time which is at the disposal of the teachers or guidance workers. The following points should be considered in connection with these records:

1. These supplement other records and should not be mixed up with substitutes.
2. The objective description of the behaviour should not be mixed up with the subjective comments.
3. Any significant behaviour, be it in the classroom, in the school or outside the school, should be recorded.
4. Behaviour, whether it is favourable, unfavourable or neither favourable nor unfavourable to the child, should be recorded.
5. The facts presented in all the anecdotes must be shifted and arranged so that they may be studied in relation to one another.

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6. The record should be regarded as confidential. It should not fall into irresponsible hands.
7. What is written down is what was seen or heard. Inferences, guesses, assumptions are omitted unless they are clearly labelled as inferences, guesses or assumption.
8. The observer has determined what aspects of behaviours are related to the dimension being appraised. He observes these only and records them only.
9. Words and phrases are used whose meaning is clear, and so far as possible, unequivocal.
10. Words and phrases are employed that are definable in terms of things rather than other words. Concrete statements are preferred to abstract ones. For example, "He became pale and his hands trembled," not "He was disturbed."
11. Words and phrases that have strong emotional connotations are avoided i.e., love, hate, insolvent, courteous, loyal, dishonest, etc.
12. Words and phrases are avoided which express the observer's judgement, or his opinion, and not his perception. Among the frequently encountered "judgmental terms" that should be avoided are the following.
 - (a) Well-behaved
 - (b) Delinquent
 - (c) Aggressive
 - (d) Did'ntry
 - (e) Industrious
 - (f) Nervous
 - (g) Happy

The usage of anecdotal records can be summed up as follows:

- They provide specific and exact description of personality and minimize generalizations.
- They are very helpful in understanding the child's behaviour in diverse situations.
- They provide a continuous record.
- They provide data for pupils to use in self-appraisal.
- A summary of these records is valuable for forwarding with a pupil when he is transferred from one school to another.
- The new members of the staff may use these records and acquaint themselves with the students.
- These records aid in clinical service.
- They stimulate teachers to use the records and to contribute to them.

3. Diary method

Diaries, if available, can be used as an important and unique tool in throwing light upon many important and vital aspects of the personality of individuals because it is the most personal of personal documents and contains the record of events, thoughts and feelings. Here, the individual is less conscious than he is elsewhere. The diary contains a delicate reflection of the emotions of an individual.

Chief characteristics of a diary are as follows:

- (i) Diary is useful when the writer has freely and frankly expressed himself.
- (ii) The writer has entered comments about the sad and happy moments of his life.
- (iii) The writer has described in detail the situations of the persons which have influenced his life.
- (iv) The writer has made continuous entries.

Usefulness of the diary are as follows:

- It throws light on the interests and feelings of the writer.
- It furnishes valuable clues of the philosophy of life.
- In the case of great persons, it has become an important source of history.
- It is a natural record.

4. Interview method

An interview may be defined as a face-to-face verbal exchange in which one person i.e., the interviewer attempts to elicit information on a variety of topics from the interviewee. Interviews are used for a variety of purposes and as such there are various types of interviews.

1. The assessment or evaluative interview for determining the fitness of a person for admission, for a job or for scholarship, etc.
2. The personality assessment interview of a student for finding out the status of development of his personality.
3. The diagnostic interview for getting some information about the home, environmental and school situations of the student or the client.
4. The introductory interview for preparing for further interviews.
5. The informative interview for giving some information to the students on subjects or careers, etc.
6. The research interview for collecting data about a problem.
7. The administrative or disciplinary interview for finding out the causes of indiscipline and taking further action.
8. The counselling interview for helping the counsellee or the student in gaining insight into the problem and assisting him solving the same.

It is to be remembered that in educational institutions, the primary purpose of personality assessment is to find out the existing status of the development of the various facets of personality and to take further measures for bringing about improvement in the child.

Preparation for the interview

- A quiet and orderly place should be provided for interview purposes.
- The teacher or the psychologist should prepare for the interview by gathering all the data concerning the student.
- The teacher or the psychologist should prepare clear objective for the interview.
- The teacher or the counsellor should keep an open mind regarding the child.
- Each interview should be considered as a step in the process of guiding the pupil.

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Merits of an interview method are as follows:

- It is the most dynamic way of understanding the individual.
- It is natural-like conversation.
- It can be made flexible so as to suit many situations
- It is relatively easy to conduct.
- It is possible to get some most confidential information from the child, which otherwise he may hesitate to reveal through writing.

Limitations of an interview method are as follows:

- It needs a trained and competent interviewer.
- It is costly in terms of labour, money and time
- It suffers from the subjective bias of the interviewer.
- The interviewee may not unfold himself.
- The interviewee may have a language handicap to express his feeling freely.

5. Observation method

Observation is one of the most ancient and widely used instruments of assessing personality. Observation has been defined as, "measurement without instruments." In education, observation is the most commonly employed of all measurement techniques. In the present as well as in the past, students have been labelled as good, fair or poor in achievement and lazy or diligent in study, etc., on the basis of observation. Similarly, teachers have listened to speeches and ranked students 1, 2, 3 and so on.

The physicians and the psychologists depend heavily on what they observe of the patient's talk, gestures and facial expressions. Observation is one of the oldest techniques that man has made use of. Even today it is our common experience to notice that farmers feel the breeze, watch the sky, sun, moon and stars, all to determine what the weather is likely to be and what season is approaching.

Merits of direct observation are as follows:

- Being a record of the actual behaviour of the child, it is more reliable and objective.
- It is a study of an individual in a natural situation and is therefore more useful than the restricted study in a test situation.
- This method can be used with children of all ages; of course, the younger the child, the easier it is to observe him. This method has been found very useful with shy children.
- It can be used with a little training and almost all teachers can use it. It does not require any special tools or equipment.
- It can be used in every situation.
- It is adaptable both to individuals and groups.

Demerits of observation method are as follows:

- There is a great scope for personal prejudices and bias of the observer.
- Records may not be written with hundred per cent accuracy as the observation is recorded after the actions of the observed. There is some time-lag.
- The observer may get only a small sample of student behaviour. It is very difficult to observe everything that a student does or says. As far as possible, observations should be collected from several teachers.

- It reveals the overt behaviour only—behaviour that is expressed and not that is within.
- Principles to be followed in making observations are as follows:
 - Observe the whole situation.
 - Select one student to observe at a time.
 - Students should be observed in their regular activities, such as in classroom, on the play ground or in going from class to class.
 - Observation should be made over a period of days.

Proper planning of observation can be done as follows:

- Specific activities or units of behaviour to be observed must be clearly defined.
- An appropriate group of subjects be selected for observation.
- Scope of observation—whether individual or group—should be decided.
- The length of each observation period, number of periods and interval between periods should be decided.
- The form of recording should be decided.
- The instruments to be used should be decided.
- Physical position of the observer should be demarcated.
- Proper tools for recording observation should be kept handy.

An expert execution demands skill and resourcefulness on the part of the investigators. This depends upon:

- Proper arrangement of special conditions for the subjects.
- Assuming proper physical position for observing.
- Focusing attention on the units of behaviour on the specific activities under observation.
- Observing discreetly the length and number of periods and intervals decided upon.
- Proper handling of the recording instrument being used.
- Utilizing suitably the training received in terms of expertness.

6. Questionnaire method

Good and Hatt point out, 'in general, the word questionnaire refers to a device for securing answers to questions by using a form which the respondent fills in himself'. Barr, Davis and Johnson define questionnaire as a 'systematic compilation of questions that are subject to a sampling of population from which information is desired'.

A questionnaire may contain two kinds of items:

- (i) The Closed or Structured Form.
 - (ii) The Open-End or Unrestricted Form.
- The Closed Form:** This form requires short and check' responses. It may provide for making Yes' or No', or just a check' from a list of suggested responses. The main advantages claimed are as:
- (a) It is very easy to respond to such a question.
 - (b) It takes a little time to answer.
 - (c) It keeps the respondent on the subject.

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(d) It is relatively objective.

(e) It is fairly easy to tabulate and analyse.

The closed form does not provide any opportunity to the respondent to express his views very clearly as there is no scope for explanatory information.

The Open-End or Unrestricted Type or Free Responses or Unstructured Form: As the name of the form indicates, the respondent is at liberty to express his attitudes, interests, preferences and decisions in his own words because no clues are provided. However, sometimes it becomes very difficult to tabulate, interpret and summarize such responses.

As far as possible, the questionnaire should be a balanced one and it should contain both open and closed type items.

Merits of using questionnaire method are as follows:

- It is less expensive and less time consuming than interview or observation.
- Its construction needs less technical skills as compared with those required in conducting interviews and observations.
- Questionnaires do not permit variations in questions and as such they help in focusing the attention of the respondents on all the significant items. The interviewing situation, on the other hand, is rarely uniform.
- A questionnaire places less pressure on the subject for immediate response. A subject has adequate time to think of the responses whereas in an interview the subject is expected to give his responses immediately.
- In an interview responses are recorded by the investigator whereas in the questionnaire, the responses are given in the language of the subjects. This brings validity to responses in the case of a questionnaire.

7.5 ATTITUDE AND ATTITUDE TEST

L.L. Thurstone states that an attitude 'is the degree of positive and negative affect associated with some psychological object'. Attitude refers to the predisposition of an individual to evaluate some aspect of his world including ideologies, objects, symbols, people etc. Attitude is the bent of mind that may be positive, negative, hostile or indifferent. One's attitude is reflected in his behaviour. In a nutshell, attitude includes the sum-total of an individual's inclination, feelings, prejudice or bias, preconceived notions, ideas, fears, threats and convictions about something.

For example, somebody's attitude towards Indian culture means his thinking about the culture of India, whether he likes or dislikes Indian culture. Social attitudes are learned from the society through interaction with the social members. Attitude of an individual changes from time to time and it is not an inborn quality, rather it is acquired.

Anastasia states, 'an attitude is often defined as tendency to react favourably towards a designated class of stimuli, such as a national or racial group, a custom or an institution. Thus defined, attitude cannot be directly observed but must be inferred from overt behaviour, both verbal and non-verbal'.

Freeman states 'an attitude is a dispositional readiness to respond to certain situation, persons or objects in a consistent manner which has been learned and has become one's typical mode of response. An attitude has a well-defined object of reference. For example, one's view regarding a class of food or drink (such as fish and liquors), sport, maths or democrats are attitudes'.

7.5.1 Characteristics of Attitude

The characteristics of attitude are as follows:

- Attitudes are not inborn but acquired.
- Attitudes differ from culture to culture.
- Attitudes are integrated into an organized system.
- Attitudes are less consistent, they can be modified.
- Attitude is a position towards outer objects, either 'for' or 'against'.
- Attitudes are socially learned.
- Attitudes are formed due to the process of differentiation.
- Attitudes are complex.
- Attitudes have readiness to respond.
- Attitudes have a time dimension.
- Attitudes have a duration factor.
- Attitudes are predisposition towards objects.
- Attitudes are observed from overt behaviour.
- An attitude has a well-defined object of reference.
- It implies a subject-object relationship.

7.5.2 Types of Attitude

The predispositions towards different things create different attitude. Attitude of a person varies from situation to situation, time to time etc. Some people have positive attitude towards religious thoughts and morality, but some has negative attitude towards it. In general, attitude is of two kinds: (i) positive attitude and (ii) negative attitude. For example, Gandhi was interested in non-violence, so he had positive attitude towards non-violence. On the other hand, he was against violence, so he had negative attitude towards violence. Besides this kind of classification of attitude, attitude may be classified into different categories like:

- Acquisitive attitude
- Play attitude
- Scientific attitude
- Business attitude
- Artistic attitude
- Religious attitude

The people who have interest in acquisition of something all the time, they have acquisitive attitude. At each and every time, they search for something. Play attitude refers to the interest in playing. The people with playing attitude, always give importance upon playing. Some people are more prone towards science and technology from the childhood, they involve themselves in small scientific activities. They have scientific bent of mind and this is known as 'scientific attitude'. Some people are very much interested in commerce and business activities. This refers to their business attitude. People with skill in art and craft, have artistic attitude. They have their interest in artistic plays, arts and crafts etc. Religious attitude refers to the positive bent of mind to religious activities. The people with religious attitude, believe in different

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7.5.4 Purposes of Attitude Testing

Behind every action, there is purpose. When we go for testing attitude of people or students, obviously there are some purposes behind it. In the teaching-learning situation, attitude testing has an important role to play. So the purposes of attitude testing are:

- To assess the entry attitude of the students towards a particular course.
- To assess how far the desirable attitudes have been developed in the students during the course and after the completion of the course.
- To help the students to develop positive attitude towards certain things.
- To help the students in their career plan.
- To help the management to make its administration and supervision a qualitative one.
- To help the teacher to overcome their weakness in the teaching-learning situation.
- To help the students to check their undesirable behaviours.

- ### 7.5.5 Measurement of Attitude

sample of Likert type scale:

1. 'Science is the *Scales* soul of present *Values* day society'.

Values:

SA	—	Strongly Agree
A	—	Agree
U	—	Undecided
D	—	Disagree
SD	—	Strongly Disagree

SA	—	Strongly Agree	5
A	—		4
U	—	Agree	3
D	—	Undecided	2
SD	—	Disagree	1

Strongly Disagree

- | | | | | | |
|----|---|---|---|---|----|
| SA | 5 | 4 | 3 | 2 | 1 |
| A | | | U | D | SD |
| U | | | | | |
| D | | | | | |
| SD | | | | | |

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Limitations of Attitude Testing

Attitude testing has certain limitations which cannot be avoided. The limitations are:

- Attitude is a subjective concept, so it is very difficult to measure attitude quantitatively.
- Attitude is such a complex affair that it cannot be represented by any single numerical index.
- Attitude is learned not inborn. So it varies from situation to situation and time to time.
- In most of cases, it is seen that there is difference between verbally expressed attitudes and attitudes reflected in behaviour.

ACTIVITY

Make a report on the characteristics of aptitude scale, and how it can change with time.

DID YOU KNOW

Interest inventory is a device which is prepared continuously to know the likes and dislikes of an individual in vocations and works.

7.6 SUMMARY

In this unit, you have learnt that:

- Aptitude of an individual towards some work fits him in the work like round peg in the round hole and square peg in the square hole.
- Aptitude is predictive in nature.
- An individual with interest and aptitude for teaching profession will get success in life; but if only interest is present without aptitude, the question of success will arise.
- An aptitude must be developed by practice and training to become an ability. Two individual may have aptitude of one kind but the degree of aptitude will be different.
- Aptitude tests assess the degree of an individual's inclination towards something.
- General aptitude tests are also known as 'scholastic aptitude tests'.
- Autobiographies provide data which can be compared with those gathered by other means. This method is very economical. The teacher or the counsellor can obtain autobiographies of the students in groups at a minimum expenditure of his time.
- The personality assessment interview of a student for finding out the status of development of his personality.

Check Your Progress

4. What is an 'attitude'?
5. State three important attitudes.
6. What are the determinants of attitude?

- An attitude is the degree of positive and negative affect associated with some psychological object. It is the bent of mind of somebody towards something, which may be positive, negative, hostile or indifferent.
- Attitude is not an inborn quality. In the teaching-learning situation, attitude testing has an important role to play.
- Thurstone and Likert scales are used to measure the attitude of the people.
- Attitude is a subjective concept, so it is very difficult to measure attitude quantitatively. A person's success in life is mostly determined by his interest in it.

7.7 KEY TERMS

- **Anecdotal:** A running description of actual examples of behaviour of a student as observed by teachers and the counsellor
- **Aptitude:** Refers to a special capability of an individual, which makes him distinct from others in an achievement field
- **Clerical aptitude:** Includes the gathering, classification, and presentation of data of all sorts, analysis and use of these data in planning, executing and determining the results of operation
- **Differential aptitude tests:** Developed for measuring the fundamental intellectual abilities within individuals
- **General aptitude tests:** Measure the general intelligence, mental ability and learning ability of individuals
- **Mechanical aptitude:** Refers to an individual's psychomotor activities; involves manipulation of objects and tools with a mechanical bent of mind

7.8 ANSWERS TO 'CHECK YOUR PROGRESS'

1. 'Aptitude' refers to a special capability of an individual, which makes him distinct from others in an achievement field.
2. The three important types of aptitude are:
 - (i) Aptitude in music
 - (ii) Aptitude in law
 - (iii) Teaching aptitude.
3. The types of aptitude tests are:
 - (i) General Aptitude Tests
 - (ii) Specified Aptitude Tests
 - (iii) Differentiated Aptitude Tests.
4. An 'attitude' is the degree of positive and negative affect associated with some psychological object.

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5. The three important attitudes are:
 - (a) acquisitive attitude
 - (b) play attitude
 - (c) scientific attitude.
6. The determinants of attitude are:
 - (a) cultural or social determinant
 - (b) psychological determinant
 - (c) functional or situational determinant.

7.9 QUESTIONS AND EXERCISES

Short-Answer Questions

1. State the characteristics and types of aptitude.
2. Classify different types of aptitude tests.
3. What is the other name for general aptitude tests?
4. What is the significance of assessing or measuring personality? Describe any method of its measurement.
5. Why are the personality tests not always valid and reliable?
6. State the purposes of attitude testing.
7. What are the limitations of attitude testing?

Long-Answer Questions

1. Explain the various aptitude tests.
2. 'Attitudes are not inborn but acquired.' Comment.
3. "Every technique of assessment of personality is a means and not an end in the assessment of personality of an individual." Discuss.
4. Discuss the determinants of attitude.

7.10 FURTHER READING

- Anastasi, A., and Urbina, S.; *Psychological Testing*, 7th edition, Prentice Hall of Private Limited, New Delhi, 1997.
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UNIT 8 EXPERIMENTS

In this unit, we will be discussing a few experiments relevant to rest of the units.

8.1 FATIGUE: EFFECT OF RESPONSIES, ATTENTION AND DISTRACTION

EXPERIMENT 1: Span of Attention

Problem:

To assess span of attention for different types of stimuli with the help of fall door type tachitoscope.

Introduction:

Research on the span of attention began as early as 1885. Cattell inferred that the number of unrelated letters that could be processed simultaneously was limited to about four or five. These findings were replicated by Sperling (1960) who found that when a large number of alphanumeric items were presented tachistoscopically, only about four or five items could be reported accurately. A wide range of explanations have been proposed for this performance limitation, which was termed as span of attention or span of apprehension. According to researchers the phenomenon can be explained by the limitations in the speed with which information can be transferred from one store to another, response-output interference, perceptual interactions among items in the display, and refractory periods in a *Information-transfer mechanism*: All of these proposals explain the phenomenon to some extent but they also may contain some element of truth, but all have some shortcomings.

Models of the span of attention fall into two general classes: processing-limitation models and storage-capacity models. Processing-limitation models assume that performance is limited by the speed or accuracy of some Process required for performing the task. Storage-capacity models account for the span of attention by assuming that performance depends on a storage buffer with a fixed capacity, and that when the number of items presented exceeds the capacity of the buffer, performance is impaired.

Studies have shown that the span of attention is determined jointly by the quality of perceptual information and the resources required to maintain information in visual working memory.

Based on the research above, one can hypothesize.

Hypothesis:

Span of attention be more for meaningful material than for meaningless material.

Method:

Sample: The subject(s) should be described in terms of relevant demographic details

such as age, class, parent's occupation, monthly salary, educational qualifications, hometown, district and socio-economic status.

Material:

- (i) Fall door type Tachistoscope,
- (ii) Tachistoscope cards, and
- (iii) Data recording sheets, pencil, eraser

Description of Material:

The Fall door type tachistoscope is a wooden board with a slit in the centre and a falling door behind. This falling door will expose the stimulus (Tachistoscope cards) through the slit approximately at the rate of 1/10th of a second by operating the lever.

Tachistoscope cards are sets of cards with drawings of black dots, meaningful words and nonsense syllables. These cards are useful in understanding the phenomenon of span for the dots, meaningful words and nonsense syllables. The set of black dots consists of 9 set of cards with dots ranging from 3 dots to 11 dots (four cards in each set). The set of meaningful cards will have 13 subsets with words ranging from 3 letters to 15 letters (four cards in each group). The set of nonsense syllables consists of 7 sets of cards ranging from 3 letter cards to 9 letter cards (four cards in each set).

Experimental Design:

Independent variable: The nature of the material (i) dots, (ii) nonsense syllables, and (iii) meaningful words.

Dependent variable: Span of attention or the number of dots/nonsense syllables/meaningful words seen in one exposure.

Controls and Precautions:

- The experiment should be conducted in a calm and quiet atmosphere.
- The participant should be comfortable with the surroundings.
- The participant should be brief about the experiment thoroughly.
- The participant should be provided with a break of 10 minutes after every stimulus.
- The intensity of stimulus/illumination should be kept constant.
- The experimenter should be vigilant and record the data meticulously.

Procedure:

The participant will be briefed about the test and instructions will be provided as following:

- (a) **Instructions:** 'This is a machine in which I will show you different things like dots, words, and non sense syllables for approximately 100 milliseconds. You have to see these things carefully from this slit (experimenter points at the slit of the tachistoscope). You have to tell me the numbers of dots you have seen, or read the words and nonsense syllables.'

- (b) **Administration:** The experimenter will arrange the tachistoscope first for the dots, then for meaningful words and nonsense syllables. The experimenter will record the number of dots or words and non words spoken by the participant. Time of exposure for all types of stimuli is 100 milliseconds. It will shorten the reaction time of the eyes in shifting from one fixation point to another. We can assume that only one fixation means that there can be only one act or stroke of attention or at least the successive fixation characteristic of serial counting or spelling will not occur.

In the similar manner, group data may be collected and average score can be calculated for the group.

Result and Analysis:

Scoring:

The participant's estimation is defined as correct or incorrect in the following way—the same number of dots in a set of four cards is given to the participant that means we give four trials to the participant with the same kind of stimulus. We consider even two correct responses out of four responses in a set as a correct estimation. We will follow similar procedure for meaningful words and nonsense syllables. The span of attention/attention for number of dots, meaningful words, and nonsense syllables is found out by calculating the maximum number of dots counted or letters read.

Data for an entire group can be collected by conducting the experiment individually on each subject. At the same time, span of attention for a range for different types of stimuli can be explored. In case of any outliers in the group, the results should be discussed in view of psychological factors like area of interest, anxiety or other personality factors.

Discussion:

The hypothesis will be accepted or rejected on the basis of the results obtained. The participant's span of attention for dots, meaningful words, and nonsense syllable is estimated. The span of attention for a group of 10 participants is also calculated by calculating the range of the scores. Graphs to illustrate the results will be made.

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S. No.	Dots (3-11)	Meaningful words (3-15)	Nonsense syllables (3-9)
1			
Correct /Incorrect			
2			
Correct /Incorrect			
3			
Correct /Incorrect			
4			
Correct /Incorrect			
5			
Correct /Incorrect			
6			
Correct /Incorrect			
7			
Correct /Incorrect			
8			
Correct /Incorrect			
9			
Correct /Incorrect			
10			
Correct /Incorrect			
11			
Correct /Incorrect			
12			
Correct /Incorrect			
13			
Correct /Incorrect			

Introspective Report:

Here the experimenter will ask the subject to give his experiences during the experiment in terms of difficulties, boredom, motivation, emotions, feelings and distractions.

EXPERIMENT 2: Division of Attention

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Problem:

To assess performance on two different types of tasks performed together.

Introduction:

One engages in multi tasking behavior every day, for instance talking on phone while driving, listening to the music while studying. Some people claim to have a mastery of performing various tasks simultaneously. Division of attention means a simultaneous focusing upon two separate activities. The activities should be separated from each other; like both of the activities should be combined in a group or one of the two activities should not be automatic.

According to Broadbent (1958), two stimuli or messages presented at the same time gain access to a sensory buffer at the same time. However, the physical characteristics of messages are used to select one message for further processing and all others are lost.

Later on, Treisman (1964) proposed that though physical characteristics are used to select one message for further processing but other messages are also given partial processing. She proposed a modified filter theory and named it as *Attenuation Theory*. She argued that some of the information of unattended message is attended.

According to all these theories one can assume that when two tasks are performed simultaneously, performance on them is affected because of the interference and complexity of mental processes active during that time.

Stroop tasks have shown that two different tasks produces interference in cognitive processing. Does it mean that multitasking produces less efficient results?

Stroop found that reading off names of colours written in different colours e.g., the word red written in yellow colour was easier and took a significantly shorter amount of time than saying aloud the colour with which the word was written. Stroop saw in his study, it is much harder to name the colour of the words than to simply say the literal sound of the intended word. This is because the brain is being tangled in a web of confusion; a concept known as interference is taking place. These words and their colours being seen are processed, but the brain must make a choice when examining these two features. Perhaps the feature considered more important, according to experience, is the easier to process. There are two noteworthy explanations that have been given for the Stroop Effect:

1. The Parallel Distributed Processing Approach: There is interference when two pathways (reading the word and naming the colour) are simultaneously activated. This interference causes conflict and a decision must be made, resulting in a weakened performance.
2. The fact that we have more practice (experience) in reading words than in naming colours: Reading words is an automatic process that is involuntary where as naming the colour is less automatic.

According to William James, attention is a process of selecting and processing multiple streams of incoming information. According to him selective attention is an information processing procedure that allows focusing on specific stimuli while preventing other distracting information to interfere. This procedure is necessary as we are not capable

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of processing all incoming stimuli simultaneously and also need to detect relevant information as quickly as possible. Selective attention is therefore a performance limiting procedure as put forward by Kahneman's model of 'limited-capacity' central processor. According to his theory, this processor evaluates how demanding it is to process the stimuli and then adjusts attention accordingly.

Based on the above researches, hypothesis can be formulated.

Hypothesis:

Recognition of lines will be better when only one task is performed.

Method:

Sample: The subject(s) should be described in terms of relevant demographic details such as age, class, parent's occupation, monthly salary, educational qualifications, hometown, district and socio-economic status.

Material:

- (i) The tachistoscope,
- (ii) tachistoscope cards, and
- (iii) Two sharp pointed pencils, record sheets

Description of material:

The tachistoscope will show stimulus of 3 to 6 short lines for 100 milliseconds. The sharp pointed pencils are used to apply pressure on fingers of the participant.

Experimental Design:

Independent variable: Number of activities separated from each other i.e., one activity is of tactile modality and other is about visual modality.

Dependent variable: Number of lines correctly identified.

The experiment will be conducted on two groups, namely (i) a control group and (ii) an experimental group. The control group will be asked to simply report the number of small lines that they see, whereas in the experimental group the subjects will be exposed to both the stimulus and will be asked to report both.

Controls and Precautions:

- The tachistoscope should be adjusted according to the participant's sitting position.
- The participant should be sitting comfortably.
- The pressure applied on the fingers should be at the same time when tachistoscope showing drawings.
- The pressure applied to fingers of both the hands should be contrastingly different.
- The data should be recorded meticulously.

(a) **Instructions:** The instructions given to the control group subjects will be as follows:

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You are provided with this simple machine which shows drawings of short lines. You will be shown the drawings for 100 millisecond and you have to tell number of short lines present in the drawings.

The instruction to the experimental group subjects will be as follows:

You are provided with this simple machine which shows drawings of short lines. You will be shown the drawings for 100 milliseconds and you have to tell number of short lines present in the drawings. Simultaneously, pressure will be applied on one finger of each hand and you have to judge pressure on which finger was more. If something is unclear, you can ask me. Otherwise, we start with the experiment.

(b) **Administration:** The experimenter will arrange the tachistoscope for the participant. The cards will be placed in the tachistoscope. The participant will told to look inside the tachistoscope and estimate the number of short lines shown in the drawing. In the experimental group, simultaneously, he/she will be given pressure on index finger of both the hands. The experimenter will choose on which hand he/she will give more pressure beforehand. Accordingly, the experimenter will apply pressure on the fingers while the participant looking at the tachistoscope. The trials can be given variably. Here, we may keep 20 trials.

Result and Analysis:

The result findings will be done by assessing correct or incorrect responses and comparing the performance of the two groups. The scores are recorded in the following manner:

1. The number of times both (perception of tactile and visual modality) were correct?
2. The number of one of them was correct?
3. The number of times neither of them correct?

The percentages of responses will be calculated.

Responses of the Participant

S. No. of Trials	Pressure on finger Left/Right	Correct/Incorrect	No. of lines	Correct/Incorrect
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				

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13				
14				
15				
16				
17				
18				
19				
20				
%				

Group data can also be utilized and results can be discussed with the help of average means. Appropriate graphs will be drawn to illustrate the findings based on which the hypothesis will either be accepted or rejected.

Discussion:

The results will be discussed in view of the findings that emerge and will be supported by earlier research in the area of division of attention.

Introspective Report:

Here the experimenter will ask the subject to give his experiences during the experiment in terms of difficulties, boredom, motivation, emotions, feelings and distractions.

EXPERIMENT 3: Span of Apprehension

The terms "span of attention" and "span of apprehension" are used interchangeably in psychology. These terms define the most number of objects which can be correctly perceived and recalled after a brief display. However, as a finer distinction span of apprehension refers to the basic processing capacity which influences span of attention.

Most of the works on span of attention focus around the works of Sperling (1960). In his experiments, Sperling presented a stimulus display. The stimulus consisted of alphabet arranged in a random order. The choice of the words was such that these did not make any sense on at the first sight. These random letters were exposed to the subjects for a very short span of time between 15–500 ms.

X	W	K	Q
V	F	S	B
G	I	U	T

The subjects were and instructed to report as many articles as they could register during the brief display. They were also instructed to report their correct position.

It was reported that the subjects consistently reported an average of 4.3 letters.

For his part, Sperling took his results to show that subjects do consciously perceive at least nine letters, even if they can remember only around four. His opening question is whether, 'more is seen than can be remembered' (1960, p. 1) and, in the light of his data, Sperling gives an affirmative answer.

George A. Miller (1956), the cognitive psychologist, had demonstrated that the number of objects an average human can hold in working memory is 7 ± 2 . However,

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Sperling demonstrated that 'more is seen than can be remembered'. It implied that although the subjects could consciously perceive nine letters, they could remember only around four.

Source: Adapted from <http://www.ucl.ac.uk/~uctyibp/Attention%20and%20Iconic%20Memory.pdf>

8.2 MIRROR DRAWING**EXPERIMENT 4: Bilateral Transfer of Learning****Problem:**

To measure bilateral transfer of motor skill from the preferred to the non preferred hand and vice versa in individuals as function of speed and accuracy.

Introduction:

Transfer of learning broadly refers to the transfer of one's knowledge and skills from one problem-solving situation to another. It often occurs without conscious thought.

The ability of the individual to apply previous experience on a new related experience is called transfer of learning. New skills and knowledge are developed when previously learnt responses and facts are linked to present ones. Cormier and Hagman, (1987) define transfer of learning as the application of skills and knowledge learned in one context, being applied in another context. Learning is meaningful when the past learning eases the progress of new learning.

Past learning and conditioning has a significant impact on the performance of new tasks. Transfer of learning from one performance situation to another performance situation is an important aspect of learning. Bilateral transfer is an aspect of the transfer of learning where training in one situation influences learning in some other situation. It also refers to transfer of a skill learned on one side of the body to the other symmetrical side of the body. So, for example, after training a task with the right hand there is an improvement in left handed performance. It is also known as 'cross transfer'. It is understood that learning on any one side of the brain, the same will be automatically transferred to the other hemisphere without any special training to it. This is called positive transfer of training. Starch (1910) introduced the use of a mirror drawing apparatus to study transfer of learning. In the study, learning to transfer a star figure by right hand facilitates learning to trace the same figure by left hand which is an example of bilateral transfer of learning.

The different types of transfer of learning are explained as following:

- Positive Transfer:** This is a situation where a previously learnt fact or information aids in the understanding of a new task. It also helps the learners to learn the new task in a better and effective manner.
- Negative Transfer:** This is a type of learning in which previous experience impacts negatively on the new one. In this case, the understanding of past skills inhibits the mastering of new ones.
- Zero Transfer:** This type of learning reveals no link between the previous learning and the recent learning.

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Based on this theoretical background, experiments can be conducted to study bilateral transfer.

One theory believes that Transfer occurs at a subconscious level. It is possible only if one has achieved 'automacity' of that which is to be transferred and if the transfer is to a problem that is sufficiently similar to the original one. The differences then are handled at a subconscious level aided by conscious thought. Studies show that motor learning can be transferred from one half of the body to the other. This form of learning occurs through a higher level cerebral mechanism.

Based on the studies discussed one can formulate the following hypothesis:

Hypothesis:

The speed and accuracy of the non-preferred hand will increase with practice of the preferred hand.

Method:**Sample:**

The subject(s) here need to be described in terms of relevant demographic details such as age, socio-economic class, parent's occupation, educational qualifications, etc. Their preferred hand is to be noted especially as that is relevant to the experiment.

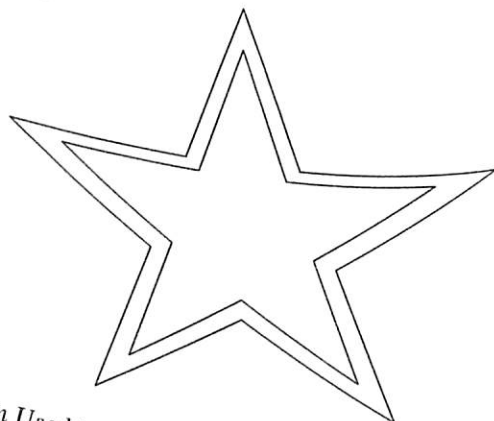
Materials:

- (i) Mirror drawing apparatus
- (ii) A star-pattern figure
- (iii) Stop watch
- (iv) Drawing pins
- (v) Graph papers

Description of the material:

The mirror drawing task was developed by Starch in 1910. In the apparatus presented to the subject, a mirror is fixed vertically and below the board there is space for placing the star figured paper. The star space is covered with a screen so that the subject may not see it directly. It can be seen only through the mirror.

A set of star patterns are provided by for use by the experimenter. These patterns have two outlines of the star between which the subject has to trace/draw a line.



Star Pattern Used in Experiment on Bilateral Transfer of Training

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Experimental Design:

Independent variable: Practise with the preferred hand.

Dependent variable: The speed and accuracy of the non preferred hand.

The **ABA** design is to be followed wherein:

A: The speed and accuracy of the non preferred hand will be assessed in terms of the number and types of errors made by the subject.

B: The subject will be asked to practice i.e., repeat the task with the preferred hand.

A: The subject will once again be asked to perform the task with the non-preferred hand and the speed and accuracy in terms of the time taken and number of errors made will be assessed.

Controls and Precautions:

The following controls and precautions to eliminate the affect of extraneous variables will be taken:

- The experiment will be conducted in a calm and quiet atmosphere.
- Three trials each with the non preferred hand will be taken before and after the subject practises with the preferred hand.
- Ten practice trials with the preferred hand will be given.
- The stopwatch will be used cautiously to measure the time taken by the subject to complete the task.
- After each attempt one minute's rest should be given to the subject.

Procedure:

The experimenter will make the subject sit comfortably and establish a good rapport and make him/her understand the purpose of the experiment.

As soon as the subject is ready, the experimenter should give the following instructions.

Instructions:

"When I say start, you will begin from the starting point and proceed on the directed path. You will move your pencil by seeing the star pattern in the mirror only. You will do it as fast as possible, but you will have to see that your pencil does not touch the boundary lines of the star figure, that you do not retrace the line and that you do not raise the pencil. You will have to reach the point from where you have started. You have to make three attempts in the beginning with the hand that you use normally and ten trials with the other hand. Lastly, you have to make three more attempts with the preferred hand."

Scoring procedure: The number of errors will be noted down in a tabular form. Errors would be:

- (a) touching the line,
- (b) re-tracing the line, and
- (c) lifting the pencil.

The time taken in each attempt will be recorded.

Result and Analysis:

Showing Data

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S. No.	Hand used	Time taken in seconds	Errors committed	Remarks
1.	NP hand			
2.	NP hand			
3.	NP hand			
4.	P hand			
5.	P hand			
6.	P hand			
7.	P hand			
8.	P hand			
9.	P hand			
10.	P hand			
11.	P hand			
12.	P hand			
13.	P hand			
14.	NP hand			
15.	NP hand			
16.	NP hand			

(i) The following means would be calculated:

- Time taken in their first three attempts by the non-preferred hand.
- Mistakes made in the first three attempts by the non-preferred hand.
- Time taken in the ten attempts by the preferred hand.
- Mistakes made in the ten attempts by the preferred hand.
- Time taken in three last three attempts by the non-preferred hand.
- Mistakes made in these last three attempts by the non-preferred hand.

(ii) Appropriate graphs to illustrate the differences between the first three and the last three attempts will be made.

(iii) The mean differences will allow one to conclude whether the hypothesis stated in the beginning of the experiment is accepted or rejected.

Discussion:

Depending on the acceptance or rejection of the hypothesis the results will be discussed in the light of previous research. The findings that emerge from the experiment have to be justified through findings of earlier research.

Conclusion: The conclusion will finally restate the acceptance or rejection of the hypothesis.

Introspective Report:

Here the experimenter will ask the subject to give his/her experiences during the experiment in terms of difficulties, boredom, motivation, emotions, feelings and distractions.

Another experiment on transfer of learning can be one involving the use of a maze.

EXPERIMENT 5: Transfer of Training in Maze Learning**Problem:**

To demonstrate transfer of training in maze learning

Introduction:

Transfer of training refers to the process whereby the skills and abilities acquired in one task facilitates performance in a similar task. The role of previous learning has also been highlighted in earlier theories. One such theory was the Theory of Mental Faculties propounded by the Greek philosophers, including Aristotle. The theory believes that exercises and regular practice will strengthen the mental faculties like memory, judgment, thinking etc. Another Theory of Identical elements which was developed by Thorndike and Woodworth (American Psychologists) indicates that it is possible for an individual to transfer the prior skills and knowledge to recent ones because both experiences are identical (share things in common). This theory suggests that successful or effective learning will happen if there are connections or interrelatedness between the old and the new experiences. Based on the researches one can hypothesize.

Hypothesis:

Proficiency and accuracy in the first task will reduce the errors and time for the second task.

Method:**Sample:**

The subject(s) here need to be described in terms of relevant demographic details such as age, socio-economic class, parent's occupation, educational qualifications, etc. Their preferred hand is to be noted especially as that is relevant to the experiment.

Materials:

- Two stylus mazes with the stylus,
- Blindfolding goggles or cloth, and
- stop watch, and record sheets.

Description of the material:

A stylus maze is a maze whose alleys consist of grooves which the subject traces by the means of a stylus. For efficient recording, the score sheets should have a plan of the maze so that the experimenter can easily enter the subject's moves. Some mazes are equipped with sheets of carbon and white paper underneath the grooves so that the subject's moves are automatically recorded.

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Experimental Design:

Independent Variable: Proficiency and accuracy in the first task (maze 1).

Dependent Variable: The speed and accuracy in the second task (maze 2).

Controls and Precautions:

- The experiment will be conducted in a calm and quiet atmosphere.
- The stopwatch will be used to accurately record the time taken by the subject each time.
- The errors such as re tracing or entering a blind alley will be recorded.
- After completion of one maze, rest period of ten minutes will be given before the second maze.
- The two mazes used will be of equal difficulty.
- Two subjects will be used the first subject will begin with maze 1 while the other will be given maze 2 first to ensure that the complexity or difficulty level of the two mazes do not affect performance.

Procedure:

The experimenter will establish a proper rapport and make the subjects understand the purpose of the experiment. With two subjects, we use the design discussed below:

Subject 1: Maze 1, followed by Maze 2

Subject 2: Maze 2, followed by Maze 1

The subject will then be given the following instructions:

Instructions:

'There is a maze and with the stylus you have to reach the end point of the maze. Before we begin I will blindfold you and I will be directing you to the starting point. When I say start, you will begin from the starting point and proceed on the directed path. You will move stylus on the path. If you hit blind alley, it will be told to you. You have to come out of the maze to finish it. Ideally it should be done without errors. An error is conventionally defined as (1) entrance into a blind alley, (2) retracing in the correct path. The task will be repeated till you achieve two errorless runs.'

The subject will then be seated blindfolded in front of the maze. The subject is given the stylus and his/her hand is put at the entrance of the maze. The experimenter instructs the subject to work as rapidly but as accurately possible. The subject begins his/her first trial after the signal from the experimenter. The experimenter should start his/her stopwatch as well and carefully note the timings in all the further trials.

The trials are continued until the subject reaches the level of mastery required. A criterion of two errorless runs is used. After completion of two errorless runs of maze 1, the subject is made to rest for 10 minutes. The subject then begins to learn the second maze. The procedure is same for the second maze. The duration of each trial has to be noted carefully with the help of stop watch.

Scoring procedure:

The observations are recorded in the following table.

Number of Trials and Time Taken to Reach Criterion

Trials	Subject 1				Subject 2			
	Maze 1		Maze 2		Maze 2		Maze 1	
	Time taken (sec)	Errors	Time taken (sec)	Errors	Time taken (sec)	Errors	Time taken (sec)	Errors
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
Total no. of trials	Total time	Total errors	Total time	Total errors	Total time	Total errors	Total time	Total errors

The experimenter can enter the subject's moves as he/she sees them being made. On that basis, the number of errors can be computed for each trial. An error is conventionally defined as (1) entrance into a blind alley, and (2) retracing in the correct path. In scoring the subject's performance, the experimenter should have a clear definition of error in mind. He/she must decide for example, how far the stylus must have been moved into a blind alley in order to be classified as an entrance.

The critical comparison is between performance on the first task and performance on the second task in terms of the total time taken to master the first and second maze and the number of errors made in both the mazes.

We compare the performance on the task learned first and on the task learned second with respect to the following scores:

1. Number of trials required to reach each criterion
2. Total amount of time required to reach each criterion
3. Total numbers of errors made before criterion was reached
4. Number of errors on each individual trial
5. Amount of time spent on each individual trial

Result and Analysis:

Learning curves are obtained by plotting time and errors against trial number. Comparison of two maze performances with respect to number of trials, number of errors, and amount of time required to reach criterion, allows us to tests for transfer

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effects. If there is a significant difference in favour of the second task, transfer effects are positive, if the difference is in favour of the first task, the transfer effects are negative. Finally, if there is no significant difference, there is zero transfer. It is interesting to compare and contrast the transfer effects revealed by the three measures. Does one of them show greater effects than the others?

To quantify the amount of transfer, we compute the percentage of saving attributable to transfer. For example, it took 12 minutes to master the first task and only 8 minutes to master the second task. The difference is 4 minutes or 33.3% of 12. We conclude that the amount of transfer, as measured by time scores, is 33.3%. Similar saving scores can be computed for trials and errors.

Discussion:

If the time and error scores for the second task fall more rapidly than for the first, this difference may be ascribed to positive transfer effects.

The findings that emerge are to be related to the research done in this field. Earlier studies and experiments can be cited to support the findings.

Finally it may be useful to examine the subject as to the methods he employed in mastering the mazes. Did he use verbal self instructions such as 'first left, then right, then left again,' etc.? Did he rely on a visual scheme of the maze? To what extent did he explicitly verbalize the principles which made positive transfer effects possible? A careful examination of the subject's report may help to throw light on the factors responsible for the transfer effects.

Conclusion:

The conclusion would be based on the acceptance or rejection of the hypothesis on the basis of the results.

Introspective Report:

Here the experimenter will ask the subject to give his experiences during the experiment in terms of difficulties, boredom, motivation, emotions, feelings and distractions.

EXPERIMENT 6: Level of Aspiration**Problem:**

To measure the level of aspiration and the subsequent achievement of a person.

Introduction:

Goals are set by individuals to receive a desired objective or purpose. The concept in psychology too carries connotations of purpose, objective and goal directed behaviour.

The systematic investigation of Level of Aspiration was by Hoppe in 1930. The term 'level of aspiration' was introduced by Dembo in 1931 and it was adopted as a quasi-tech term to refer to an individual's goals when engaged in a specific activity. Based upon the initial experiments, a standardization of experimental procedure to investigate the individual's goals was developed. Subjects were involved in a simple task as dart throwing, arithmetic problems etc.

The time taken to complete the task and the number of correct answers or any other quantifiable feature of performance was recorded. Basically, three types of information would be available for analysis—a performance score, a statement about future performance and sometimes an estimate of past performance.

The first theory accounting for behaviour in level of aspiration was by Frank in 1935. He proposed that the statement about the future (level of aspiration) to the past performance depends upon the relative strength of three needs: (a) the need to keep the level of aspiration high irrespective of performance, (b) the need to make level of aspiration approximate the level of future performance and (c) the need to avoid failure.

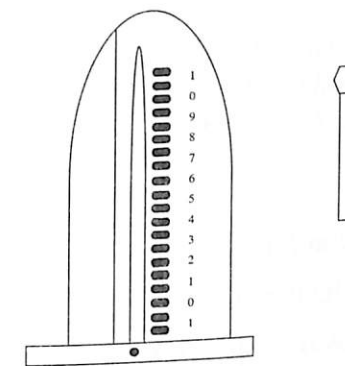
Explanation of response patterns observed in level of aspiration in terms of need or desire of success and failure and avoidance of failure were widely adopted. Common to all these was the assumption that level of aspiration is related to goals which one may or may not reach.

Method:

Sample: The subject(s) should be described in terms of the relevant demographic details such as age, qualifications, socio-economic background etc.

Materials:

- (i) Rotter's Level of aspiration board, wooden rod, iron ball, and
- (ii) Recording sheets, pencil, eraser.

(c) Description of the Material:

Rotter's Level of Aspiration Board

The Rotter's level of aspiration is a wooden board, having one metre long and about 6" width. In the middle of the board there is a long groove end to end with one inch width. At the centre of the board in the groove there is a grading like scale with equal spacing and there are numbers written in white colour which are very much visible. The numbers start to increase from the bottom end from 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 and then going on decreasing order 10 to 9, 8, 7, 6, 5, 4, 3, 2, 1 and 0 at the upper end. There is a small hollow space for the iron ball to be placed. With the help of the wooden rod, the iron ball can be pushed upward through the long groove and the ball can easily move from bottom end to the upper end. The ball can stop at any of the graded place numbered depending upon exerted on the ball. The position of the board should be parallel to the ground. This can be adjusted with the help of a clamp attached to the upper portion of the board. The wooden rod is one foot long and about 1/2th diameter. The iron ball is normal size of 3/4".

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Procedure:

The experimenter should first set up the apparatus quite appropriately for the experiment. He/She should try and test whether the ball moves through the groove easily and also stops at a point steadily. He/She should prepare his/her record sheet for making entries of the trials.

- (a) **Instructions:** The experimenter should make the participant to sit comfortably in front of the apparatus. Then the experimenter should provide following instructions to the participants.

"Now please look at this board. There is a long groove and there are also numbers. You will have to push the iron ball with this rod along the groove, so that the ball moves through the groove and stops against a number. If the ball stops at the number 10 you score 10. If it stops at 8 your score is 8. If the ball stops at zero or where there is no number or if it bounces off then your score is zero."

The experimenter should demonstrate some trials and hand over the rod to the participant.

"First you can have some practices. You can have 20 practice hits."

The experimenter should tell the participant the score he has made for every practice hit. On completing 20 practice hits the experimenter should tell the experiment.

"Now you can begin the test. I shall give you 20 trials. A trial constitutes five hits. Thus you will hit the ball 100 times. If you hit the ball every time at 10, then your score for a trial is 50 (5×10). If you hit the ball every time at zero, the score is zero. Before you start every hit call for a number you going to aim at and tell me and I will tell you the score you have achieved in that trials of five hits. After every trial of five hits I will tell you the score".

- (b) **Administration:** The experimenter should note down at once the number called for by the participant and also the number he hit. At the end of five hits, he/she should work out the score for each trial and tell the participant.

Precautions:

- Participant should be comfortable.
- Participant should not be fatigued.
- Participant's interest level is very important.
- Stop watch should be used meticulously.

Result and Analysis:

The experimenter will work out the scores for all 20 trials performed by the participant and write them in Table. What the score participant aspired in each trial and what he performed in each trial also should be given in Table.

The Goal Discrepancy Score (GDS) is the difference between aspiration for a trial and the performance in the previous trial. The formula is:

$$GDS = AN (\text{Aspiration}) - PN-1 (\text{Performance } 1).$$

It is positive if the aspiration higher than the performance on previous trial. PN-1 refers to the performance in the previous trial.

There may also be difference between aspiration and the performance in the given trials. This score is called Attainment Discrepancy Score (ADS). The formula is:

$$ADS = AN (\text{Aspiration}) - PN (\text{Performance})$$

It is positive if the performance is lower than the aspired score and if it is negative the aspired score is lower than the performance score.

For 20 trials, there are 19 goal discrepancy scores and 20 attainment scores. The mean score of all the 19 GDS and for all the 20 ADS should be worked out for the participant and should be presented in Table.

Find out the mean aspiration score of the participant for all 20 trials and his mean performance score and present them in Table.

Scores of Participants in Level of Aspiration Experiment

Nature of score	Trials																				T O T A L	M E A N
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
AN of each trial																						
PN of each trial																						
GDS (AN-PN-1)																						
ADS (AN-PN)																						

Note: AN= Aspiration Score, PN= Performance Score, GDS= Goal Discrepancy score, ADS= Aspiration Discrepancy score

Collect the group data and present them in Table. In Table, present the mean aspiration scores, performance scores, mean GDS, and mean ADS.

Group Data in Level of Aspiration Experiment

S. No.	Name	Mean Aspiration Score	Mean Performance Score	Mean Goal Discrepancy Score	Mean Aspiration Discrepancy score	Aspiration Positive (+) Negative (-)
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
Mean Score						

Discussion:

Discuss the individual's Goal Discrepancy Scores and Aspiration Discrepancy Scores for each trial. Is he influenced by success? Does the level of success increase his/her level of aspiration or decrease his/her level of aspiration? If in spite of lower performance is he/she making the statement of the same aspiration level? State the main factors influencing the level of aspiration of the participant.

What is the mean value of aspiration in your participant? Is it above the group mean or below? What is the rank of GDS and ADS of your participant? Whose GDS

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and ADS are highest? Whose GDS and ADS are lowest? State the reasons for all these.

State whether your participant has positive or negative aspiration. Has he attained the positive ADS or negative GDS? How many in the group have positive GDS and positive ADS.

State the factors having influence in the level of aspiration.

Introspective Report:

Here the experimenter will ask the subject to give his/her experiences during the experiment in terms of difficulties, boredom, motivation, emotions, feelings and distractions.