Lecture 1

General introduction to pedagogy

1.1.The definition of pedagogy. Etymology of the term pedagogy.

1.2. Subfields of pedagogy.

1.3. The historical outline of pedagogy. The fathers of pedagogical science.

1.4. Learning theories and pedagogy.

Key notions: *pedagogy (pedagogics), teaching style, pedagogical approaches, instructive strategy (theory), Instructional theory, the Gagné Assumption, Didactics, Open learning, Critical pedagogy, Social Pedagogy, Andragogy, Creative Pedagogy, the comparative pedagogics, Socratic method, Ignatian pedagogy, "the age of nature", an inductive method, "Universal Pedagogy", the theory of mastery-learning, Behaviorism, Cognitivism, and Constructivism*

1.1. Pedagogy or pedagogics is the study of being a teacher or the process of teaching; the function or work of a teacher; teaching; the art or science of teaching; education; instructional methods; study of teaching methods; including the aims of education and the ways in which such goals may be achieved; the field relies heavily on educational psychology, or theories about the way in which learning takes place; the art or profession of teaching; Preparatory training or instruction, the art or method of teaching; pedagogics. Pedagogy, the art and science of teaching. Pedagogy is the way in which teachers accompany learners in their growth and deve-lopment. **Pedagogy**, literally translated, is the art or science of teaching children. In modern day usage, it is a synonym for "teaching" or "education," particularly in scholarly writings. Throughout history, educators and philosophers have discussed different pedagogical approaches to education, and numerous theories and techniques have been proposed. Educators use a variety of research and discussion about learning theories to create their personal pedagogy, and are often faced with the challenge of incorporating new technology into their teaching style. Successful education for all depends on teachers being able to embrace both the art and science of pedagogy, acting as "parents" who understand the needs, abilities, and experiences of their students while also being trained in the best methods of communication and presentation of appropriate materials.

The term generally refers to strategies of instruction, or a style of instruction.

Pedagogy is also occasionally referred to as the correct use of instructive strategies. For example, Paulo Freire (September 19, 1921 – May 2, 1997) was a Brazilian educator and influential theorist of critical pedagogy, referred to his method of teaching adult humans as "critical pedagogy". In correlation with those instructive strategies the instructor's own philosophical beliefs of instruction are harbored and

governed by the pupil's background knowledge and experience, situation, and environment, as well as learning goals set by the student and teacher.

Etymology. The word comes from the Greek which means "child" and "lead"; so it literally means "to lead the child". The Latin-derived word for pedagogy: child-instruction, is in modern use in English to refer to the whole context of instruction, learning, and the actual operation involved therein, although both words have roughly the same original meaning. In English the term pedagogy is used to refer to instructive theory; trainee teachers learn their subject and also the pedagogy appropriate for teaching that subject. The introduction of information technology into schools has necessitated changes in pedagogy; teachers are adopting new methods of teaching facilitated by the new technology. First key thinkers: Jean-Jacques Rousseau, Johann Heinrich Pestalozzi.

1.2. Instructional theory is a discipline that focuses on how to structure material for promoting the education of human beings, particularly youth. Originating in the United States in the late 1970s, *instructional theory* is typically divided into ***two categories***: ***the cognitive*** and ***behaviorist*** schools of thought. Instructional theory was spawned off the 1956 work of Benjamin Bloom, a University of Chicago professor, and the results of his Taxonomy of Education Objectives — one of the first modern codifications of the learning process. One of the first instructional theorists was Robert M. Gagne, who in 1965 published *Conditions of Learning* for the Florida State University's Department of Educational Research. **Robert Mills Gagné** (August 21, 1916–April 28, 2002) was an American educational psychologist best known for his "Conditions of Learning". Gagné pioneered the science of instruction during WWII for the air force with pilot training. Later he went on to develop a series of studies and works that helped codify what is now considered to be 'good instruction.' He was also involved in applying concepts of instructional theory to the design of computer-based training and multimedia-based learning.

Gagné's work is sometimes summarized as **the Gagné Assumption**. The assumption is that ***different types of learning*** exist, and that different instructional conditions are most likely to bring about these different types of learning. One of Gagné's major contributions to the theory of instruction was the model ***"Nine Events of Instruction"***.

- Gain attention
- Inform learner of objectives
- Stimulate recall of prior learning
- Present stimulus material
- Provide learner guidance
- Elicit performance
- Provide feedback
- Assess performance
- Enhance retention transfer

Didactics is the theory of teaching and, in a wider sense, the theory and practical application of teaching and learning. Didactics refers only to the science of teaching. A didactic method (Greek: to teach; lore) is a teaching method that follows a consistent scientific approach or educational style to engage the student's mind. The term can also be used to refer to a specific didactic method, as for instance constructivist didactics. This theory might be contrasted with *Open learning*, in which people can learn by themselves, in an unstructured manner, on topics of interest. **Open learning** is a teaching method that is, among others, founded on the work of Célestin Freinet and Maria Montessori. Open learning is supposed to allow pupils self-determined, independent and interest-guided learning.

Critical pedagogy is a philosophy of education described by Henry Giroux as an "educational movement, guided by passion and principle, to help students develop consciousness of freedom, recognize authoritarian tendencies, and connect knowledge to power and the ability to take constructive action. Critical pedagogy includes relationships between teaching and learning. This proponents claim that it is a continuous process of what they call "unlearning," "learning" and "relearning," "reflection," "evaluation," and the impact that these actions have on the students, in particular students who have been historically and they believe continue to be disenfranchised by what they call "traditional schooling."

Social Pedagogy is an academic discipline concerned with theory and practice of **holistic education** and care. Holistic education is a philosophy of education based on the premise that each person finds identity, meaning, and purpose in life through connections to the community, to the natural world, and to humanitarian values such as compassion and peace. Holistic education aims to call forth from people an intrinsic reverence for life and a passionate love of learning. This is the definition given by **Ron Miller**, founder of the journal Holistic Education Review (now entitled **Encounter: Education for Meaning and Social Justice**). The term holistic education is often used to refer to the more democratic and humanistic types of **alternative education**. Alternative education, also known as non-traditional education or educational alternative, includes a number of approaches to teaching and learning other than mainstream or **traditional education**. Educational alternatives, which include **charter schools**, **alternative schools**, **independent schools**, and **home-based learning** vary widely, but often emphasize the value of small class size, close relationships between students and teachers, and a **sense of community**. Social pedagogy is based on humanistic values stressing human dignity, mutual respect, trust, unconditional appreciation, and equality. It is underpinned by a fundamental concept of children, young people and adults as equal human beings with rich and extraordinary potential and considers them competent, resourceful and active agents.

Overall, social pedagogy aims to achieve:

- Holistic education – education of head (cognitive knowledge), heart (emotional and spiritual learning), and hands (practical and physical skills);
- Holistic well-being – strengthening health-sustaining factors and providing support for people to enjoy a long-lasting feeling of happiness;
- To enable children, young people as well as adults to empower themselves and be self-responsible persons who take responsibility for their society;
- To promote human welfare and prevent or ease social problems.

Andragogy consists of learning strategies focused on adults. It is often interpreted as the process of engaging adult learners with the structure of learning experience. Originally used by Alexander Kapp (a German educator) in 1833, andragogy was developed into a theory of adult education by the American educator Malcolm Knowles. Knowles asserted that andragogy (Greek: "man-leading") should be distinguished from the more commonly used *pedagogy* (Greek: "child-leading").

Knowles' theory can be stated with ***six assumptions*** related to motivation of adult learning:

1. Adults need to know the reason for learning something (Need to Know)
2. Experience (including error) provides the basis for learning activities (Foundation).
3. Adults need to be responsible for their decisions on education; involvement in the planning and evaluation of their instruction (Self-concept), the idea or mental image one has of oneself and one's strengths, weaknesses, status, etc.; self-image;
4. Adults are most interested in learning subjects having immediate relevance to their work and/or personal lives (Readiness).
5. Adult learning is problem-centered rather than content-oriented (Orientation).
6. Adults respond better to internal versus external motivators (Motivation).

Creative Pedagogy is the science and art of creative teaching. Creative Pedagogy teaches learners how to learn creatively, become creators of themselves and creators of their future. Creative Pedagogy generalizes:

- art (creativity) classes
- technical creativity
- psychology of creativity
- Creative Problem Solving
- creatively-oriented courses

The Torrance Tests of Creative Thinking (TTCT) originally involved simple tests of divergent thinking and other problem-solving skills, which were scored on four scales:

- Fluency. The total number of interpretable, meaningful, and relevant ideas generated in response to the stimulus.
- Flexibility. The number of different categories of relevant responses.

- Originality. The statistical rarity of the responses.
- Elaboration. The amount of detail in the responses. The founder of Creative Pedagogy, Dr. Andrei Aleinikov.

The comparative pedagogics is a science about comparison of features of general and particular tendencies, laws and mechanisms of development of education in world, regional, national and federal scales. It is a science which analyzes predominantly in the substantial plan a state, the basic tendencies and mechanisms of development of education on a global scale, opens interrelations of overall tendencies of national or regional peculiarity, reveals positive and negative aspects of international pedagogical experience, the form and means of mutual enrichment of national pedagogical cultures. **Comparative pedagogics** – independent sphere of scientific knowledge which has its object, a subject, specific functions and tasks. **Object of comparative pedagogics** - education as process of social and cultural reproduction of the person in the modern world, and also as social institute in global, regional and national scales. **Subject of comparative pedagogics** - a state, tendencies and mechanisms of development world (foreign and domestic) pedagogical experience and national pedagogical cultures of the present.

The primary goals of comparative pedagogics:

- The system description of the newest and little-known facts representing the substantial developments of education in foreign countries.
- Systematization and analysis of the quantitative data about the education systems development in these countries.
- Revealing and analysis of the major mechanisms and tendencies of education development in various countries.
- Development of the scientifically-grounded quality assessment criteria and efficiency of education either, in one or another country.
- Determination of priority directions of an educational policy.
- Comparison of achievements and weaknesses of education in foreign countries.

The main methodological question of comparative pedagogics consists in, what measure and in what forms is possible and expedient to use achievements of the modern foreign experience in its activity.

The basic functions of comparative pedagogics:

- Unification and ordering of terms and concepts of the pedagogical documentation of different countries with the purpose of simplification of foreign experience studying by experts.
- Comparison of different models of education and an educational policy, theoretical aims of foreign and domestic teachers and education figures.
- Forecasting probable ways of development of education in the future.
- Development of plans for education development.

The basic categories and concepts of comparative pedagogics:

- Education, a world education system, social institute of education, strategy of education development, standardization of education, the modern foreign pedagogical experience, a national education system and training, pedagogical culture, an educational policy, the pedagogical documentation.

1.3. From the very beginning, educators have tried ***to find interesting ways to bring out the possibilities of intelligence and a love of learning*** from their pupils. The advent of writing circa 3000 B.C.E. resulted in a style of education that was more self-reflective, with specialized occupations requiring particular skills and knowledge: scribes, astronomers, and so forth. In ancient Greece, ***philosophy*** helped questions of educational methods enter national discourse. In both *Republic* and *Dialogues,* ***Plato,*** Greek philosopher, advocated a system of instruction using the ***Socratic method*** of teaching through questions. Through the clever use of questions and answers, Plato's teacher, Socrates, was able to show even an uneducated slave boy how the logic leading to the Pythagorean Theorem **(pĭ-thāg'ə-rē'ən)** was within him.

Since the time they launched their first school in 1548, the Jesuits (**jezh**-oo-it) A (religious order of men in the Roman Catholic Church) believed that a ***high quality education*** is the best path to meaningful lives of leadership and service. The Jesuits adapted available educational models while developing their own pedagogical methods to become the "schoolmasters of Europe." ***Ignatian pedagogy***, which ***embodies five key teaching elements***—context, experience, reflection, action, and evaluation—is the process by which teachers accompany learners in the lifelong pursuit of competence, conscience, and compassionate commitment. This method aims to support teachers to be the best teachers, motivates students by personalizing their learning experience, and stresses the social dimension of both learning and teaching. Underlying the educational process in its entirety is the religious dimension, for the ultimate purpose of such education is considered to be the discovery of God.

During the mid-1600s in what is now the Czech Republic, the educator Comenius wrote the first children's textbook containing vivid illustrations, entitled *The Visible World in Pictures*. Known as the "Father of Modern Education," Comenius believed in a holistic approach to education. He taught that ***education*** began in the earliest days of childhood and ***continued throughout life***, and that learning, spiritual, and emotional growth were all woven together. Unlike most of society at the time, he also advocated the formal education of women. Well respected throughout northern Europe, he was asked to restructure the Swedish school system.

During the 1700s, the philosopher Jean-Jacques Rousseau presented his methodology on the education of children in his novel *Emile,* the story of the education of a young boy. Within his novel, Rousseau described the importance of having a focus on both environment and personal experience. Different learning stages are described: for example, during the "the age of nature" (from ages 2 to 12), Rousseau argued that a boy should receive no moral instruction or verbal learning, as the mind should be "left undisturbed until its faculties have developed." Instead, education during this stage should be focused on physical and sensory development.

In the late eighteenth and early nineteenth centuries, **Johann Heinrich Pestalozzi**, a Swiss pedagogue and educational reformer, greatly influenced the development of the educational system in Europe and America. His educational method emphasized the importance of providing a loving, family-type environment in which the child can grow and flourish naturally, balancing their intellectual, physical, and technical abilities, with emotional, moral, ethical, and religious growth. Pestalozzi asserted that education ***should be centered on the child, not the curriculum***. Since knowledge lies within human beings, the purpose of teaching is to find the way to unfold that hidden knowledge. Pestalozzi proposed direct experience as the best method to accomplish this, advocating spontaneity and self-activity, in contrast to the rigid, teacher-centered, and curriculum-based methods generally used in schools. He ***advocated an inductive method***, in which the child first learns to observe, to correct its own mistakes, and to analyze and describe the object of inquiry. In order to allow children to obtain more experience from nature, Pestalozzi expanded the elementary school curriculum to include geography, natural science, fine art, and music.

Friedrich Wilhelm August Fröbel, a German educator, also made substantial advances in children's education, particularly the invention of the kindergarten system for young children. His own difficulties as a child, his love of nature, and his faith in God, combined with his experiences with Pestalozzi's educational system, were the foundation for his insights into the education of very young children. He recognized the importance of ***play*** in order to allow their creativity to unfold and blossom. His school included a large room for play, as well as a garden outside for the children to grow flowers and other plants. Thus, he developed the *kindergarten*—a "garden for children" where they could grow naturally, with support from their parents and teachers.

A contemporary of Fröbel, ***Johann Friedrich Herbart***, was a German philosopher, psychologist, and founder of pedagogy as an academic discipline, had a very different approach to education. Based on his views of philosophy, which were based on a philosophical realism, and psychology, that all mental phenomena result from the interaction of elementary ideas, Herbart believed that a science of education was possible. Herbart's work and his belief that a science of education was possible led to the establishment and acceptance of pedagogy as an academic discipline studied on the university level.

In his work *Universal Pedagogy* (1906), Herbart advocated ***five formal steps*** in teaching, which were translated into a practical teaching methodology:

1. preparation – relating new material to be learned to relevant existing ideas (memories) to stimulate the student's interest (prepare students to be ready for the new lesson)
2. presentation – presenting new material in the form of actual experience of concrete objects (present the new lesson)
3. association – comparison of the new idea with existing ideas to find similarities and differences and thus implant the new idea in the mind of the student (associate the new lesson with ideas studied earlier)

4. generalization – procedures designed to take learning beyond perception and experience of the concrete into the realm of abstract concepts (use examples to illustrate the lesson's major points)
5. application – using the newly acquired knowledge so that it becomes an integral part of the life of the student (test students to ensure they learned the new lesson).

Herbart's ideas were widely adopted in Germany and also the United States, translated into the simple ***five-step teaching method*** that became the basic pedagogical practice in the nineteenth century. By the twentieth century, however, the steps had become mechanical and Herbart's underlying ideas on ethics, psychology, and aesthetics had been forgotten. In their place, new pedagogical theories, such as those of John Dewey in the United States, which freed the child from what had become a controlled learning environment, grew in popularity.

Although his teaching methodology was overtaken by new ideas, Herbart's institution of pedagogy as an academic field has remained. The idea of a ***science of education,*** including psychology as a source of information about the nature of the learner as well as the learning process, has continued to advance teaching methods.

A number of other people contributed to the theories of pedagogy, among these are: **Benjamin S. Bloom** (February 21, 1913 – September 13, 1999) was a Jewish-American educational psychologist who made contributions to the classification of educational objectives and to the theory of ***mastery-learning.*** Mastery Learning is an instructional method that presumes all children can learn if they are provided with the appropriate learning conditions. Specifically, mastery learning is a method whereby students are not advanced to a subsequent learning objective until they demonstrate proficiency with the current one. Mastery learning curricula generally consist of discrete topics which all students begin together. Students who do not satisfactorily complete a topic are given additional instruction until they succeed. Students who master the topic early engage in enrichment activities until the entire class can progress together. **Paulo Freire** (September 19, 1921 – May 2, 1997) was a Brazilian educator and influential theorist of critical pedagogy. In fact, in many ways his *Pedagogy of the Oppressed* (1970) which emphasized the need to provide native populations with an education which was simultaneously new and modern (rather than traditional) and anti-colonial. ***Jan Amos Komenský*** (28 March 1592 – 4 November 1670) was a Czech teacher, educator, and writer. He is often considered the father of modern education. The influence of Comenius was in formulating the general theory of education. Komenský is the first to formulate that idea of "education according to nature". In his *Didactica Magna* (Great Didactic), he outlined a system of schools that is the exact counterpart of the existing American system of kindergarten, elementary school, secondary school, college, and university, and where he first applied or attempted to apply in a systematic manner the principles of thought and of investigation, newly formulated by those philosophers, to the organization of education in all its aspects. ***Johann Heinrich Pestalozzi*** (12 January 1746 – 17 February 1827) was a Swiss pedagogue and educational reformer who exemplified Romanticism in his approach. Pestalozzi's philosophy of education was

based on a ***four-sphere concept*** of life and the premise that human nature was essentially good. The first three 'exterior' spheres - home and family, vocational and individual self-determination, and state and nation - recognized the family, the utility of individuality, and the applicability of the parent-child relationship to society as a whole in the development of a child's character, attitude toward learning, and sense of duty. The last 'exterior' sphere - inner sense - posited that education, having provided a means of satisfying one's basic needs, results in inner peace and a keen belief in God. ***Jean-Jacques Rousseau*** (28 June 1712 – 2 July 1778) was a major Genevan philosopher, writer, and composer of 18th-century Romanticism. His political philosophy heavily influenced the French Revolution, as well as the American Revolution and the overall development of modern political, sociological and educational thought. His novel, *Émile: or, On Education* is a seminal (fruitful, зародковий) treatise on the education of the whole person for citizenship. Rousseau's philosophy of education is concerned with developing the pupil's character and moral sense, so that he may learn to practice self-mastery and remain virtuous even in the unnatural and imperfect society in which he will have to live. The hypothetical boy, Émile, is to be raised in the countryside, which, Rousseau believes, is a more natural and healthy environment than the city, under the guardianship of a tutor who will guide him through various learning experiences arranged by the tutor. Today we would call this the disciplinary method of "natural consequences" since, like modern psychologists, Rousseau felt that children learn right and wrong through experiencing the consequences of their acts rather than through physical punishment.

1.4. The importance of psychology in understanding the interest, abilities, and learning processes of students, has become an integral part of theories of education. Theories of learning have been developed to describe how people learn; these theories aid in the development of various pedagogical approaches. There are ***three main perspectives in*** *educational psychology*: *Behaviorism, Cognitivism, and Constructivism*.

Behaviorism, a term coined by American psychologist *John B. Watson*, is based around the idea of a stimulus-response pattern of conditioned behavior. One of the most famous experiments in classical conditioning was performed by Russian physiologist *Ivan Pavlov*. By introducing the sound of a bell before placing food in front of a dog, Pavlov was able to create a conditioned response in the dog where the dog would salivate (виділяти слину) at the ringing of the bell alone.

Some of the most important developments in behaviorism, especially as it relates to pedagogy, occurred in the mid-twentieth century with the work of *B. F. Skinner*. Skinner studied operant (operating, producing effects), or voluntary, behavior, and called his approach "operant conditioning." Skinner's mechanisms included: positive reinforcement,negative reinforcement, non-reinforcement, and punishment. In a classroom setting, non-reinforcement might consist of ignoring misbehavior in the hope that lack of reinforcement would discourage the behavior.

Cognitivism became the dominant force in psychology in the late twentieth century, replacing behaviorism as the most popular paradigm for understanding the learning

process. Cognitive theory is not a refutation of behaviorism, but rather an expansion that uses changes in behavior as indicators for processes within a learner's mind. The concept of cognitive theory utilizes the concept of "schema," a structure of internal knowledge, as well as the concept of short and long term memory. Cognitive theory suggests that meaningful information is easier to retain, and new information is affected by context, environment, and previous schemata.

Constructivism is a set of assumptions about the nature of human learning. It values developmentally appropriate teacher-supported learning that is initiated and directed by the student.

According to the constructivist approach, learners construct and interpret their individual realities based on their perceptions of experiences. Learning is regarded as a process in which the learner actively constructs new ideas or concepts based upon current and past knowledge and beliefs. Constructivist learning, therefore, is a very personal endeavor, whereby internalized concepts, rules, and general principles may consequently be applied in a practical real-world context. The teacher acts as a facilitator (a person responsible for leading or coordinating the work of a group, as one who leads a group discussion), encouraging students to discover principles for themselves and to construct knowledge by working to solve realistic problems. Working with other students enables the sharing of viewpoints and an emphasis on collaborative learning.

Lecture 2

Theories of learning and psychological perspectives

2.1. Four twentieth century theories of education.

2.2. Learning styles. Modern learning styles and their related research theories.

2.3. Defining psychology. The beginnings of psychology as a science. Its early contributors: Wundt's Laboratory, Tichener and Structuralism, James and Functionalism.

2.4. Key theories (approaches) of psychology.

Key words: *progressivism, perennialism, essentialism, reconstructionism, learning styles, Auditory learners, visual learners, kinesthetic learners, Generative Learning, Inquiry-based instruction, Discovery Learning, and knowledge building, behavioral psychology, Classical conditioning, Operant conditioning, The Unconditioned Stimulus, The Unconditioned Response, The Conditioned Stimulus, The Conditioned Response, cognitive theories, cognitive psychology, Schemas, Assimilation, Accommodation, Equilibration, the theory General Intelligence, the theory Primary Mental Abilities, the theory Multiple Intelligences, Triarchic Theory of Intelligence, developmental theories, theories of personality, social learning theory, observational learning, modeling process, humanistic psychology, Maslow's hierarchy of needs, Social Psychology Theories, The Behavioral Neuroscience Approach, The Evolutionary Psychology Approach, sociocultural approach*

2.1. 1. ***PROGRESSIVISM*** (John Dewey, William H. Kilpatrick, John Childs)

1. Education should be life itself, not a preparation for living. **2.** Learning should be directly related to the interests of the child. **3.** Learning through problem solving should take precedence over the inculcating of subject matter. **4.** The teacher's role is not to direct but to advise. **5.** The school should encourage cooperation rather than competition. **6.** Only democracy permits - indeed encourages - the free interplay of ideas and personalities that is a necessary condition of true growth.

2. ***PERENNIALISM*** (Robert Hutchins, Mortimer Adler)

1. Despite differing environments, human nature remains the same everywhere; hence, education should be the same for everyone. **2.** Since rationality is man's highest attribute, he must use it to direct his instinctual nature in accordance with deliberately chosen ends. **3.** It is education's task to import knowledge of eternal truth. **4.** Education is not an imitation of life but a preparation for it. **5.** The student should be taught certain basic subjects that will acquaint him with the world's permanencies. **6.** Students should study the great works of literature, philosophy, history, and science in which men through the ages have revealed their greatest aspirations and achievements.

3. ***ESSENTIALISM*** (William Bagley, Herman Horne)

1. Learning, of its very nature, involves hard work and often unwilling application. **2.** The initiative in education should lie with the teacher rather than with the pupil. **3.** The heart of the educational process is the assimilation of prescribed subject matter. **4.** The school should retain traditional methods of mental discipline.

4. ***RECONSTRUCTIONISM*** (George Counts, Theodore Brameld)

1. Education must commit itself here and now to the creation of a new social order that will fulfill the basic values of our culture and at the same time harmonize with the underlying social and economic forces of the modern world. **2.** The new society must be a genuine democracy, whose major institutions and resources are controlled by the people themselves. **3.** The child, the school, and education itself are conditioned inexorably by social and cultural forces. **4.** The teacher must convince his pupils of the validity and urgency of the reconstructionist solution, but he must do so with scrupulous regard for democratic procedures. **5.** The means and ends of education must be completely re-fashioned to meet the demands of the present cultural crisis and to accord with the findings of the behavioral sciences.

2.2. The idea of individualized ***"learning styles"*** originated in the 1970s, and gained considerable popularity. **A learning style** is the specific method of learning that is presumed to allow a particular individual to learn best. With this concept, each individual processes information in one of several manners (or a combination thereof). ***Auditory learners*** process information and learn best through hearing, while ***visual learners*** process information best through seeing it. ***Kinesthetic learners*** process information best when it is combined with physical movement. It has been proposed that teachers should assess the learning styles of their students and adapt their classroom methods to best fit each student's learning style. Teachers can use techniques like role-playing or historical reenactment in the classroom to reinforce information through kinesthetic learning, or graphic organizers such as diagrams and concept maps for visual learners. Older students, once aware of which learning style fits them best, can use a variety of techniques in their studies to help them learn. For example, auditory learners may find that reading aloud works well for them. Many students use a combination of auditory, visual, and kinesthetic learning styles.

The modern learning models include: **Generative Learning, Inquiry-based instruction, Discovery Learning, and knowledge building.** According to the generative theory of learning, people understand new concepts by relating them to prior experiences and prior stored information. **Generative learning is a theory that involves the active integration of new ideas with the learner's existing schemata (**A diagrammatic representation; an outline or a model).

Generative learning strategies can be broken down into four elements: **1) recall; 2) integration; 3) organization; 4) elaboration.** Strategies from these four areas can be used **alone** or **in conjunctionwith one another** to achieve a learning goal. **Recall** involves the learner pulling information from long term memory. The goal of recall is to learn **fact-based information**. Techniques include repetition, rehearsal/practice, review, and mnemonics (the process or technique of improving or developing

the memory). **Integration** involves the learner to integrating new knowledge with prior knowledge. The goal of integration is transform information into a more easily remembered form (paraphrasing, summarizing, generate questions orexamples generate analogies and metaphors). **Organization** involves the learner relating prior knowledge to new ideas and concepts in meaningful ways. Techniques include analysis of key ideas, outlining, categorization. **Elaboration** involves the connection of new material to information or ideas already in the learner's mind. The goal of elaboration is to add ideas to new information (Bloom's synthesis of new information). Elaboration methods include generation of mental images or physical diagrams, free writing, sentence elaboration, visual displays, slides. ***Wittrock's model*** of generative learning consists of ***four major processes***: ***(a)attention, (b) motivation, (c) knowledge and preconceptions, and (d) generation.*** In this model of generative learning, the brain is a model builder. It actively controls the processes of generating meaning and plans of action that make sense of experience and that respond to perceived realities. The focus in learning is on ***generating relations***, rather than on storing information. Within this framework,teaching becomes the process of leading learners to use their generative
processes to construct meanings and plans of action.The functional model focuses on: ***(a) learning processes, such as attention; (b) motivationalprocesses, such as attribution and interests; (c) knowledge creation processes,such as preconceptions, concepts, and beliefs; and (d) most importantly,the processes of generation,*** including analogies, metaphors, and summaries. In this model, comprehension and understanding result from the processes of generating relations both among concepts and between experience or prior learning and new information. the model of generative learning has been built upon neural research. Neural research on the brain informs cognitive models of learning and teaching, sets limits upon them,and makes them more educationally useful. Neural systems show self-direction, self-control, motivation, and arousal. They generate meaning and significance. They learn, and they modify their future operations. They do not passively receive and record information. They are generative systems. For many years, neural research on attention and learning has demonstrated the generative nature of these brain processes, which function actively and dynamically to construct meaning and to interpret experience, rather than passively to receive and record incoming, sensory information. **Luria's (**1973) first of three functional systems of the brain involves arousal and attention. The plans and intentions of the learner, influence the attentional and motivational processes of the brain, and consequently, the stimuli we attend to and the level of activity we devote to those stimuli and their meaning. Luria's (1973) second of three functional brain units-the unit for receiving, analyzing, and storing information- codes and integrates information from all of the senses. Luria's third functional unit of the brain, for planning, organizing, and regulating cognition and behavior, functions as a generative processor and as the integrator of the brain's generative functions. The intentions and purposes of the learner play central roles in determining motivation and arousal, in selectively attending to events, and in generating meaning for these events by relating them to knowledge and experience. From ***Cognitive research*** we understand learning consists of the active generation of meaning, not the passive recording of information. **Connectionism** which presents an

associationistic,subconceptual model of memory Within this conception, learners acquire concepts and nodes indirectly and inductively by averaging weights of repeated experiences of similar events. In a broad sense, **neuropsychology** stands for the branch of brain sciences that aims to understand how the structure and function of the brain relate to specific cognitive and psychological processes. It studies the structure and function of the brain related to specific psychological processes and behavior.

Inquiry-based instruction is a student-centered and teacher-guided instructional approach that engages students in investigating real world questions that they choose within a broad thematic framework. Students acquire and analyze information, develop and support propositions, provide solutions, and design technology and arts products that demonstrate their thinking and make their learning visible.

Discovery Learning (Jerome Bruner, American psychologist, born 1915).Discovery learning is an inquiry-based, constructivist learning theory that takes place in problem solving situations where the learner draws on his or her own past experience and existing knowledge to discover facts and relationships and new truths to be learned. As a result, students may be more more likely to remember concepts and knowledge discovered on their own. Models that are based upon discovery learning model include: guided discovery, problem-based learning, simulation-based learning, case-based learning, incidental learning, among others.

The **Knowledge Building** (KB) theory was created and developed by Carl Bereiter and Marlene Scardamalia for describing what a community of learners needs to accomplish in order to create knowledge. The theory addresses the need to educate people for the knowledge age society, in which knowledge and innovation are pervasive. Knowledge building is seen as creating or modifying public knowledge. KB produces knowledge that lives 'in the world', and is available to be worked on and used by other people. Knowledge building can be considered as *deep constructivism* that involves making a collective inquiry into a specific topic, and coming to a deeper understanding through interactive questioning, dialogue, and continuing improvement of ideas. Ideas are thus the medium of operation in KB environments. The teacher becomes a guide, rather than a director, and allows students to take over a significant portion of the responsibility for their own learning, including planning, execution, and evaluation. One of the hallmarks of Knowledge building is a sense of ***we*** superseding the sense of ***I***, a feeling that the group is operating collectively, and not just as an assemblage of individuals.

2.3. Psychology comes from Gk. psykhe- "breath, spirit, soul" (see psyche) + logia "study of." Psychology *is a scientific study of behavior and mental processes*. There are three aspects to this definition: science, behavior, and mental processes. As a **science**, *psychology uses systematic methods to observe, describe, predict, and explain behavior.* **Behavior** *is everything we do that can be directly observed.* **Mental processes** *are the thoughts, feelings, and motives that each of us experiences privately, but that cannot be observed directly*. Though we cannot directly see

thoughts and feelings, they are nonetheless real. They include *thinking* about kissing someone, a baby's *feelings* when its mother leaves the room, and a college student's *memory* of the motorcycle episode. Let's explorethe development and evolution of the field of psychology. For centuries, philosophers enjoyed arguing and debating questions like: Do we acquire knowledge? Does information come to us through our senses and our experiences with the environment, or is it inborn? Philosophers think about thinking and dicuss thinking. So do psychologists, but psychologists ***systematically obtain and interperet evidence about thinking***. Philosophy was not the only discipline out of which psychology emerged. Psychology's roots also are in the natural sciences of biology and physiology. The intellectual atmosphere when psychology emerged as a science was heavily flavoured by the work of British naturalists Charles Darwin. He developed the concept of ***natural selection***, *that the organisms that are best adapted to their world are the most likely to survive, reproduce, and pass on their characteristics to their offspring.* Physiologists such as the German Johannes Muller already were proposing in the middle of the 19th century that the brain's role is to associate incoming sensory information with appropriate motor response. Indeed, it was a philosopher –physician who puts the pieces of the philosophy –natural science puzzle together to create the academic discipline of psychology. The man is ***Wilhelm Wundt (1832-1920)***, who is credited with developing the first scientific laboratory in psychology. Wilhelm Wundt was studying awareness of immediate experience, or what psychologists call ***consciousness***. The year is 1892. **Edward Titchener** (1876-1927), an Englishman and a student of Wundt's attempted to classify the structures of the mind. He conceived sensations and thoughts as structures of the mind. This approach became known as **structuralism**, *an early theory of psychology developed by Wundt and Titchener that emphasized the importance of conscious thought and classification of the mind's structures.* The first psychologist in the United States was **William James** (1890-1950). James argued that our *minds are characterized* by a continuous flow of information about our experiences. James emphasized the mind's ability to continuously evolve as it adapts to information about the environment. James view shifted attention away from the mind's content to the mind's functions. James especially believed that the function of choosing was important in adapting to a changing world. This approach became known as ***functionalism***, *William James' theory that psychology's role is to study the functions of the mind and behavior in adapting to the environment.*

2.4. Much of what we know about human thought and behavior has emerged thanks to various ***psychology theories***. For example, **behavioral theories** demonstrated how conditioning can be used to learn new information and behaviors. Behavioral psychology, also known as behaviorism, is a theory of learning based upon the idea that all behaviors are acquired through conditioning. Advocated by famous psychologists such as John B. Watson and B.F. Skinner, behavioral theories dominated psychology during the early half of the twentieth century. Conditioning occurs through interaction with the environment. According to behaviorism, behavior

can be studied in a systematic and observable manner with no consideration of internal mental states. There are ***two major types*** of conditioning:

1. ***Classical conditioning*** is a technique used in behavioral training in which a naturally occurring stimulus is paired with a response.

2. ***Operant conditioning*** ***(***sometimes referred to as instrumental conditioning) is a method of learning that occurs through rewards and punishments for behavior. Through operant conditioning, an association is made between a behavior and a consequence for that behavior.

Major Thinkers in Behaviorism:

- Ivan Pavlov
- B. F. Skinner
- Edward Thorndike
- John B. Watson
- Clark Hull

It is important to be familiar with ***the basic principles*** of the process.

The Unconditioned Stimulus is one that unconditionally, naturally, and automatically triggers a response. For example, when you smell one of your favorite foods, you may immediately feel very hungry. In this example, the smell of the food is the unconditioned stimulus.

The Unconditioned Response is the unlearned response that occurs naturally in response to the unconditioned stimulus. In our example, the feeling of hunger in response to the smell of food is the unconditioned response.

The Conditioned Stimulus is previously neutral stimulus that, after becoming associated with the unconditioned stimulus, eventually comes to trigger a conditioned response. In our earlier example, suppose that when you smelled your favorite food, you also heard the sound of a whistle. While the whistle is unrelated to the smell of the food, if the sound of the whistle was paired multiple times with the smell, the sound would eventually trigger the conditioned response. In this case, ***the sound of the whistle*** is the conditioned stimulus.

The Conditioned Response is the learned response to the previously neutral stimulus. In our example, the conditioned response would ***be feeling hungry*** when you heard the sound of the whistle.

Classical Conditioning in the Real World: For example, many dog trainers use classical conditioning techniques to help people train their pets; These techniques are also useful in the treatment of phobias or anxiety problems. Teachers are able to apply classical conditioning in the class by creating a positive classroom environment to help students overcome anxiety or fear. Pairing an anxiety-provoking situation, such as

performing in front of a group, with pleasant surroundings helps the student learn new associations. Instead of feeling anxious and tense in these situations, the child will learn to stay relaxed and calm.

Cognitive Theories of psychology are focused on internal states, such as motivation, problem solving, decision-making, thinking, and attention.

Cognitive psychology is the branch of psychology that studies mental processes including how people think, perceive, remember and learn. The core focus of cognitive psychology is on how people acquire, process and store information. Until the 1950s, behaviorism was the dominant school of thought in psychology. Between 1950 and 1970, the tide began to shift against behavioral psychology to focus on topics such as attention, memory, and problem solving. And the first use of the term "cognitive psychology."

- cognitive psychology is concerned with internal mental states.
- cognitive psychology uses scientific research methods to study mental processes.

Jean Piaget's stage theory describes the cognitive development of children. Cognitive development involves changes in cognitive process and abilities. In Piaget's view, early cognitive development involves processes based upon actions and later progresses into changes in mental operations.

Key Concepts

Schemas - A schema describes both the mental and physical actions involved in understanding and knowing. Schemas are categories of knowledge that help us to interpret and understand the world. In Piaget's view, a schema includes both a category of knowledge and the process of obtaining that knowledge. As experiences happen, this new information is used to modify, add to, or change previously existing schemas. For example, a child may have a schema about a type of animal, such as a dog. If the child's sole experience has been with small dogs, a child might believe that all dogs are small, furry, and have four legs. Suppose then that the child encounters a very large dog. The child will take in this new information, modifying the previously existing schema to include this new information.

Assimilation - The process of taking in (include, encompass) new information into our previously existing schema's is known as assimilation. The process is somewhat subjective, because we tend to modify experience or information somewhat to fit in with our preexisting beliefs. In the example above, seeing a dog and labeling it "dog" is an example of assimilating the animal into the child's dog schema.

Accommodation - Accommodation involves altering existing schemas, or ideas, as a result of new information or new experiences. New schemas may also be developed during this process.

Equilibration - As children progress through the stages of cognitive development, it is important to maintain a balance between applying previous knowledge (assimilation) and changing behavior to account for new knowledge (accommodation). Equilibration helps explain how children are able to move from one stage of thought into the next.

While intelligence is one of the most talked about subjects within psychology, there is no standard definition of what exactly constitutes 'intelligence.' Some researchers have suggested that intelligence is a single, general ability, while other believe that intelligence encompasses a range of aptitudes,skills and talents.

The following are some of the ***major theories of intelligence*** that have emerged during the last 100 years.

Charles Spearman - General Intelligence:
British psychologist Charles Spearman (1863-1945) described a concept he referred to as general intelligence, or the *g factor*. Spearman concluded that people who performed well on one cognitive test tended to perform well on other tests, while those who scored badly on one test tended to score badly on other. He concluded that ***intelligence is general cognitive ability that could be measured and numerically expressed***.

Louis L. Thurstone - Primary Mental Abilities: Psychologist Louis L. Thurstone (1887-1955). Thurstone's theory focused on seven different "primary mental abilities" (Thurstone, 1938). The abilities that he described were:

- Verbal comprehension
- Reasoning
- Perceptual speed
- Numerical ability
- Word fluency
- Associative memory
- Spatial visualization

Howard Gardner - Multiple Intelligences: Gardner proposed that numerical expressions of human intelligence are not a full and accurate depiction of people's abilities. His theory describes ***eight distinct intelligences*** that are based on skills and abilities that are valued within different cultures:

- Visual-spatial Intelligence
- Verbal-linguistic Intelligence
- Bodily-kinesthetic Intelligence
- Logical-mathematical Intelligence
- Interpersonal Intelligence
- Musical Intelligence
- Intra personal Intelligence
- Naturalistic Intelligence

Robert Sternberg - Triarchic Theory of Intelligence: Sternberg proposed what he refers to as ***'successful intelligence,'*** which is comprised of ***three different factors***:

- ***Analytical intelligence***: This component refers to problem-solving abilities.
- ***Creative intelligence***: This aspect of intelligence involves the ability to deal with new situations using past experiences and current skills.
- ***Practical intelligence***: This element refers to the ability to adapt to a changing environment.

Today, psychologists often account for the many different theoretical viewpoints when discussing intelligence and acknowledge that this debate ***is ongoing***.
Developmental Theories provide a framework for thinking about human growth, development, and learning.
Erik Erikson's theory of psychosocial development is one of the best-known ***theories of personality*** in psychology. Erikson believed that personality develops ***in a series of stages***. One of the main elements of Erikson's psychosocial stage theory is the development of **ego identity**. Ego identity is the conscious sense of self that we develop through social interaction. According to Erikson, our ego identity is constantly changing due to new experience and information we acquire in our daily interactions with others. In addition to ego identity, Erikson also believed ***that a sense of competence*** also motivates behaviors and actions. Each stage in Erikson's theory is concerned with becoming competent in an area of life. If the stage is handled well, the person will feel a sense of mastery, which he sometimes referred to as **ego strength** or **ego quality**. If the stage is managed poorly, the person will emerge with a sense of inadequacy.

In each stage, Erikson believed people experience a **conflict** that serves as a turning point in development. In Erikson's view, these conflicts are centered on either developing a psychological quality or failing to develop that quality.

Psycho social Stage 1 - Trust vs. Mistrust

The first stage of Erikson's theory of psychosocial development occurs between birth and one year of age and is the most fundamental stage in life. Because an infant is utterly dependent, the development of trust is based on the dependability and quality of the child's caregivers. If a child successfully develops trust, he or she will feel safe and secure in the world. Caregivers who are inconsistent, emotionally unavailable, or rejecting contribute to feelings of mistrust in the children they care for. Failure to develop trust will result in fear and a belief that the world is inconsistent and unpredictable.

Psycho social Stage 2 - Autonomy vs. Shame and Doubt. The second stage of Erikson's theory of psychosocial development takes place during early childhood and is focused on children developing a greater sense of personal control.Other important

events include gaining more control over food choices, toy preferences, and clothing selection.Children who successfully complete this stage feel secure and confident, while those who do not are left with a sense of inadequacy and self-doubt.

Psychosocial Stage 3 - Initiative vs. Guilt. During the preschool years, children begin to assert their power and control over the world through directing play and other social interaction. Children who are successful at this stage feel capable and able to lead others. Those who fail to acquire these skills are left with a sense of guilt, self-doubt and lack of initiative.

Psychosocial Stage 4 - Industry vs. Inferiority. This stage covers the early school years from approximately age 5 to 11.Through social interactions, children begin to develop a sense of pride in their accomplishments and abilities. Children who are encouraged and commended by parents and teachers develop a feeling of competence and belief in their skills.

Psychosocial Stage 5 - Identity vs. Confusion. During adolescence, children are exploring their independence and developing a sense of self.Those who receive proper encouragement and reinforcement through personal exploration will emerge from this stage with a strong sense of self and a feeling of independence and control. Those who remain unsure of their beliefs and desires will insecure and confused about themselves and the future.

Psychosocial Stage 6 - Intimacy vs. Isolation. This stage covers the period of early adulthood when people are exploring personal relationships. Erikson believed it was vital that people develop close, committed relationships with other people. Remember that each step builds on skills learned in previous steps. Erikson believed that a strong sense of personal identity was important to developing intimate relationships. Studies have demonstrated that those with a poor sense of self tend to have less committed relationships and are more likely to suffer emotional isolation, loneliness, and depression.

Psychosocial Stage 7 - Generativity vs. Stagnation. During adulthood, we continue to build our lives, focusing on our career and family.Those who are successful during this phase will feel that they are contributing to the world by being active in their home and community. Those who fail to attain this skill will feel unproductive and uninvolved in the world.

Psychosocial Stage 8 - Integrity vs. Despair. This phase occurs during old age and is focused on reflecting back on life. Those who are unsuccessful during this phase will feel that their life has been wasted and will experience many regrets. The individual will be left with feelings of bitterness and despair. Those who feel proud of their accomplishments will feel a sense of integrity.

Social Learning Theory

The social learning theory proposed by Albert Bandura (Canadian psychologist) added ***a social element***, arguing that people can learn new information and behaviors ***by watching other people***. Known as ***observational learning*** (or modeling), this type of learning can be used to explain a wide variety of behaviors.

Basic Social Learning Concepts. Observational Learning.

1. People can learn through observation. Bandura demonstrated that children learn and imitate behaviors they have observed in other people.

2. Mental states are important to learning. Bandura described intrinsic reinforcement as a form of internal reward, such as pride, satisfaction, and a sense of accomplishment.

3. Learning does not necessarily lead to a change in behavior. Observational learning demonstrates that people can learn new information without demonstrating new behaviors.

The Modeling Process. Not all observed behaviors are effectively learned. Certain requirements and steps must also be followed. The ***following steps*** are involved in the observational learning and modeling process:

1.Attention: In order to learn, you need to be paying attention. Anything that detracts your attention is going to have a negative effect on observational learning. If the model interesting or there is a novel aspect to the situation, you are far more likely to dedicate your full attention to learning.

2.Retention: The ability to store information is also an important part of the learning process. Retention can be affected by a number of factors, but the ability to pull up information later and act on it is vital to observational learning.

3. Reproduction: it is time to actually perform the behavior you observed. Further practice of the learned behavior leads to improvement and skill advancement.

4.Motivation: Finally, in order for observational learning to be successful, you have to be motivated to imitate the behavior that has been modeled. Reinforcement and punishment play an important role in motivation. For example, if you see another student rewarded with extra credit for being to class on time, you might start to show up a few minutes early each day.

Humanist Theories. Humanistic psychology theories began to grow in popularity during the 1950s. humanist theories instead ***emphasized the basic goodness of human beings***. Some of the major humanist theorists include Carl Rogers and Abraham Maslow. During the 1950s, humanistic psychology began as a reaction to psychoanalysis and behaviorism, which dominated psychology at the time.

In 1962, Abraham Maslow published *Toward a Psychology of Being*, in which he described humanistic psychology as the "third force" in psychology. The first and second forces were behaviorism and psychoanalysis respectively. Each branch of psychology has contributed to our understanding of the human mind and behavior.

Major Thinkers in Humanistic Psychology

- Abraham Maslow
- Carl Rogers

Psychologist Abraham Maslow (American psychologist) first introduced his concept of a hierarchy of needs in his 1943 paper "A Theory of Human Motivation" and his subsequent book, *Motivation and Personality*. This hierarchy suggests that people ***are motivated to fulfill basic needs before moving on to other needs.*** Maslow's hierarchy of needs is most often displayed as a pyramid. The lowest levels of the pyramid are made up of the most basic needs, while the more complex needs are located at the top of the pyramid. Needs at the bottom of the pyramid are basic physical requirements including the need for food, water, sleep and warmth. Once these lower-level needs have been met, people can move on to the next level of needs, which are for safety and security.

Five Levels of the Hierarchy of Needs

There are five different levels in Maslow's hierarchy of needs:

1. **Physiological Needs**
   These include the most basic needs that are vital to survival, such as the need for water, air, food and sleep. Maslow believed that these needs are the most basic and instinctive needs in the hierarchy because all needs become secondary until these physiological needs are met.
2. **Security Needs**
   These include needs for safety and security. Security needs are important for survival, but they are not as demanding as the physiological needs. Examples of security needs include a desire for steady employment, health insurance, safe neighborhoods and shelter from the environment.
3. **Social Needs**
   These include needs for belonging, love and affection. Maslow considered these needs to be less basic than physiological and security needs. Relationships such as friendships, romantic attachments and families help fulfill this need for companionship and acceptance, as does involvement in social, community or religious groups.
4. **Esteem Needs**
   After the first three needs have been satisfied, esteem needs becomes increasingly important. These include the need for things that reflect on self-esteem, personal worth, social recognition and accomplishment.

5. **Self-actualizing Needs**
   This is the highest level of Maslow's hierarchy of needs. Self-actualizing people are self-aware, concerned with personal growth, less concerned with the opinions of others and interested fulfilling their potential.

Personality Theories

Almost everyday we describe and assess the personalities of the people around us. Personality psychology looks at the patterns of thoughts, feelings, and behavior that make a person unique. Some of the best known theories in psychology are devoted to the subject of personality.

The founder of **psychoanalytic theory** was Sigmund Freud. Before we can understand Freud's theory of personality, we must first understand his view of how the mind is organized. According to Freud, the mind can be divided into ***two main parts***:

1. **The conscious mind** includes everything that we are aware of. This is the aspect of our mental processing that we can think and talk about rationally. A part of this includes our memory, which is not always part of consciousness.
2. **The unconscious mind** is a reservoir of feelings, thoughts, urges, and memories that outside of our conscious awareness. Most of the contents of the unconscious are unacceptable or unpleasant, such as feelings of pain, anxiety, or conflict.

According to Sigmund Freud's *psychoanalytic theory of personality*, personality is composed of three elements. These three elements of personality--known as ***the id, the ego and the superego***--work together to create complex human behaviors.

The Id:The id is the only component of personality that is present from birth, the id is the source of all psychic energy, making it the primary component of personality. The id is driven by the *pleasure principle*, which strives for immediate gratification of all desires, wants, and needs. If these needs are not satisfied immediately, the result is a state anxiety or tension. For example, an increase in hunger or thirst should produce an immediate attempt to eat or drink. The id is very important early in life, because it ensures that an infant's needs are met. If the infant is hungry or uncomfortable, he or she will cry until the demands of the id are met.

The Ego:The ego is the component of personality that is responsible for dealing with reality. According to Freud, the ego develops from the id and ensures that the impulses of the id can be expressed in a manner acceptable in the real world.

The Superego:The last component of personality. The superego is the aspect of personality that holds all of our internalized moral standards and ideals that we acquire from both parents and society--our sense of right and wrong. The superego provides guidelines for making judgments. According to Freud, the superego begins

to emerge at around age five. According to Freud, the key to a healthy personality is a balance between the id, the ego, and the superego.

the Big Five Dimensions of Personality. Personality researchers (D. W. Fiske (1949), Norman (1967), Smith (1967), Goldberg (1981), and McCrae & Costa (1987) have proposed that there are five basic dimensions of personality.

1. **Extraversion:** This trait includes characteristics such as excitability, sociability, talkativeness, assertiveness, and high amounts of emotional expressiveness.
2. **Agreeableness:** This personality dimension includes attributes such as trust, altruism, kindness, affection, and other prosocial behaviors.
3. **Conscientiousness:** Common features of this dimension include high levels of thoughtfulness, with good impulse control and goal-directed behaviors. Those high in conscientiousness tend to be organized and mindful of details.
4. **Neuroticism:** Individuals high in this trait tend to experience emotional instability, anxiety, moodiness, irritability, and sadness.
5. **Openness:** This trait features characteristics such as imagination and insight, and those high in this trait also tend to have a broad range of interests.

These dimensions represent broad areas of personality. Research has demonstrated that these groupings of characteristics tend to occur together in many people, and these traits do not always occur together.

Social Psychology Theories. Social theories are generally centered on specific social phenomena, including group behavior, prosocial behavior, social influence, love and much more. Social psychology ***is focused on situations***. Social psychologists are interested in the impact that social environment and interaction has on attitudes and behaviors.

It is important to distinguish between social psychology and sociology. Sociologists are interested in the institutions and culture that influence social psychology. Psychologists instead focus on situational variables that affect social behavior.

Interest in leadership increased during the early part of the twentieth century. While many different ***leadership theories*** have emerged, most can be classified as one of eight major types:

1. "Great Man" Theories: *Great man theories* assume that the capacity for leadership is inherent – that great leaders are born, not made.

2. Trait Theories: assume that people inherit certain qualities and traits that make them better suited to leadership.

3. Contingency Theories: focus on particular variables related to the environment that might determine which particular style of leadership is best suited for the situation. Success depends upon a number of variables, including the leadership style, qualities of the followers and aspects of the situation.

4. Situational Theories: Situational theories propose that leaders choose the best course of action based upon situational variables. Different styles of leadership may be more appropriate for certain types of decision-making.

5. Behavioral Theories: According to this theory, people can *learn* to become leaders through teaching and observation.

6. Participative Theories: These leaders encourage participation and contributions from group members and help group members feel more relevant and committed to the decision-making process.

7. Management Theories: focus on the role of supervision, organization and group performance. These theories base leadership on a system of rewards and punishments.

8. Relationship Theories: focus upon the connections formed between leaders and followers. Leaders with this style often have high ethical and moral standards.

According to ***The Behavioral Neuroscience Approach,*** *the brain and nervous system are central to understanding behavior, thought, and emotion.* Our remarkable capabilities as human beings would not be possible without our brains. The human brain and nervous system constitute the most complex, intricate, and elegant system imaginable. Neurobiogists believe that thoughts have a physical basis in the brain. The human brain is divided into left and right sides. **Roger Sperry** made one of the most exciting discoveries in neuroscience when he revealed that some aspects of our behavior are controlled more by one side of the brain than by the other. Our own human gift of speech, for example, primary involves the left side of our brain.

The Evolutionary Psychology Approach. It's psychology's newest approach which *emphasizes the importance of adaptation, reproduction, and survival of the fittest" in explaining behavior.* The evolutionary psychology approach focuses on conditions that allow individuals to survive or to fail. David Buss' ideas on evolutionary psychology have ushered in a whole new wave of interest in ***how evolution is involved in explaining human behavior***. He believes that just as evolution shapes our physical features, such as body shape and hight, it also influences how we make decisions, how aggressive we are, our fears. ***Steven Pinker*** argues that "how the mind works" can be summarized by three main points: (1) The minds computes, (2) the mind was designed to compute by evolution, and (3) these computations are performed by specialized brain systems that natural selection has designed to achieve specific goals, such as survival.

The **sociocultural approach** *emphasizes that culture, ethnicity, and gender are essential to understanding behavior, thought, and emotion*. **Culture** *is the behavior*

patterns, beliefs, and other products of a particular group of people, such as values, work patterns, music, dress, diet, and ceremonies, that are passed on from generation to generation. **Ethnicity** (the word ethnic comes from the Greek word for "nation") *is based on cultural heritage, nationality characteristics, race, religion, and language*. Ethnicity involves descent from common ancestors, usually in a specifiable part of the world. Given the descent of individuals from common anscestors, people often make inferences about someone's ethnicity based on physical features believed to be typical of an ethnic group.

Apart from above-discussed two aspects of sociocultural influences – culture and ethnicity, a third important aspect is **gender**, *the sociological dimension of being male or female.* **Sex** *is the biological dimension of being female or male.*

The sociocultural approach is one of psychology's newest lenses for examining behavior and mental processes. As the future brings increasing contact between people from quite different backgrounds, the sociocultural approach will help to expand psychology's role as a relevant discipline in the twenty-first century.

Lecture 3

Educational and learning processes

3.1. Learning. Characteristics of the Learning Process. Laws of Learning.

3.2. Psychological learning factors. Levels of learning.

3.3. Aims and objectives of education.

3.4. Bloom's Taxonomy of Educational Objectives or learning domains.

3.5. The process of education. Teaching methods in education.

Key words: *learning, Purposeful learning Process, internal learning experience, active learning process, miltidimentional nature of learning, individual learning technique, Law of Readiness, Law of Exercise, Law of Effect, Law of Primacy, Law of Intensity, Law of Recency, factors of perceptive learning, learning levels, Progressive Aim of Education, Education for Citizenship, Social Efficiency as an Aim of Education, Vocational Aim of Education, Knowledge as an Aim of Education, Personality development as an aim of Education, Taxonomy of Educational Objectives, cognitive domain, affective domain, psychomotor domain, didactic modes, Testing and questioning, Explaining, Modeling, demonstrating, collaborating*

3.1. Anyone who intends to guide and direct the learning activities of others requires ***a detailed understanding of the nature and processes*** of learning. Instructors are masters of many skills. What they teach demands a high degree of competence in presenting subject matter. Nevertheless, HOW they teach depends largely on their understanding of the learning process and the ability to apply this understanding.

DEFINITION OF LEARNING

What is "learning?" Learning takes place when there is a change in a student's behavior. It may not be directly observable. Learning is based ***on observation of behavior changes*** that result from a person's interaction with their environment. An individual's learning may involve changes in any of **three areas**:

1. Manner of perceiving and thinking.

2. Physical behavior (motor skills).

3. Emotional reactions or attitudes.

Learning refers to any of these changes when they occur as a result of an experience. Thus, learning cannot be literally described but the conditions under which it occurs can be identified. The instructor should understand these conditions and apply them when teaching.

CHARACTERISTICS OF THE LEARNING PROCESS

Purposeful Process. Most people have definite ideas about what they want to achieve. They have goals or clear objectives. Effective instructors seek ways ***to create new learning situations to meet the trainees' goals.*** Motivation, the force that impels a person toward a goal, is the instructor's most effective tool to encourage learning. This can be either weak or strong motivation depending on the situation.

Internal Experience. The instructor cannot learn for the trainee, nor can he or she pour predigested learning into the trainee's head. ***The trainee can learn only from his or her own experiences.*** A person's knowledge is a result of their experiences and manner of perceiving them and reacting to them. No two people have exactly the same experiences. All learning stems from experience. For example, by repeated drill, a trainee can learn to repeat a list of words or to recite the principles of leadership. However, trainees can make the list an actual part of their lives only if they understand them well enough to apply the ideas that they represent correctly in real situations.

Active Process. Since learning comes only through experience, the trainee must be actively involved in the experience. This activity can take many forms. Learning is more than simply exposing a trainee to an idea or a skill. Likewise, one cannot safely assume that trainees can apply what they know just because they correctly quote a paragraph from a textbook. The trainee must become actively involved in the learning situation, but just any kind of involving activity will not suffice. The trainee must engage in the appropriate activity. Obviously, learning a physical skill requires experience in performing that skill. The instructor should understand, however, that ***mental habits are always learned through practice***. Even attitudes are developed or modified as an individual reacts emotionally to a stimulus.

Multidimensional. Learning is multidimensional. Multidimensional develops new concept. In other words, it is possible to learn other things while concentrating on or practicing the main subject. While practicing drill, the trainees learn teamwork and cooperation. While learning dormitory arrangement, they learn attention to details and following explicit instructions.

Individual Process. All trainees do not learn at the same rate. New instructors are likely to be discouraged when they discover that a well-planned lesson does not enable them to teach all the trainees with equal effectiveness. They soon recognize this as a natural and predictable problem because trainees seldom learn at the same rate. Differences in rates of learning are based on differences in intelligence, background, experience, interests, desire to learn, and countless other psychological, emotional and physical factors. Instructors must recognize these differences in determining the amount of subject matter to teach, the rate of which they will cover the material, and the appropriate time to teach it. Once the slower trainees are identified, it is up to the instructor to bring them up to the level of the rest of the flight. You must identify their weak areas, bring the areas to their attention, and show them how to correct them. You may be fortunate and have some trainees who excel. These trainees may be used to help others during their practice. This serves a twofold

purpose. The fast learning trainees are relieved from boredom and the slow learning trainees receive the benefit of the peers' expertise.

Laws of Learning

Edward L. Thorndike (August 31, 1874 – August 9, 1949) was an American psychologist, who helped lay the scientific foundation for modern educational psychology, who in the early 1900's postulated several "Laws of Learning," that seemed generally applicable to the learning process. Since that time, other educational psychologists have found that the learning process is indeed more complex than the "laws" identified. However, the "laws" do provide the instructor with insight into the learning process that will assist in providing a rewarding experience to the trainee. The laws that follow are not necessarily stated as Professor Thorndike first stated them. Over the years, they have been restated and supplemented, but, in essence, they may be attributed to him.

Over the years, educational psychologists have identitied several principles which seem generally applicable to the learning process. They provide additional insight into what makes people learn most effectively.

The ***first three are the basic laws***:

1. **the law of readiness**,

2. **the law of exercise**,

3. and the most famous and still generally accepted, **the law of effect**.

The ***other three laws were added later as a result of experimental studies***:

4.**the law of primacy,**

5.**the law of intensity,**

6. **and the law of recency**

As with anything else relative to the instruction and learning process, nothing that we do is a singular item; ***a combination of activities occurs at the same time to make the experience complete.***

Law of Readiness

The Law of Readiness means a person can learn when ***physically and mentally adjusted (ready) to receive stimuli***. Individuals learn best when they are ready to learn, and they will not learn much if they see no reason for learning. If trainees have a strong purpose, a clear objective and a sound reason for learning, they usually make more progress than trainees who lack motivation. When trainees are ready to learn, they are more willing to participate in the learning process, and this simplifies the

instructor's job. If outside responsibilities or worries weigh heavily on trainees' minds or if their personal problems seem unsolvable, they may have little interest in learning.

Law of Exercise

The Law of Exercise stresses the idea that ***repetition is basic*** to the development of adequate responses; ***things most often repeated are easiest remembered***. The mind can rarely recall new concepts or practices after a single exposure, but every time it is practiced, learning continues and is enforced. The instructor must provide opportunities for trainees to practice or repeat the task. Repetition consists of many types of activities, ***including recall, review, restatement, manual drill and physical application.*** Remember that practice makes permanent, not perfect unless the task is taught correctly.

Law of Effect

This law involves the ***emotional reaction*** of the learner. Learning will always be much more effective when a feeling of satisfaction, pleasantness, or reward accompanies or is a result of the learning process. Learning is strengthened when it is accompanied by a pleasant or satisfying feeling and that it is weakened when it is associated with an unpleasant experience. An experience that produces feelings of defeat, frustration, anger or confusion in a trainee is unpleasant. Instructors should be cautious about using negative motivation. Usually it is better to show trainees that a problem is not impossible, but is within their capability to understand and solve.

Law of Primacy

This law states that the state of being first, often creates a strong, almost unshakeable impression. For the instructor, this means that what they ***teach the first time must be correct***. If a subject is incorrectly taught, it must be corrected. It is more difficult to un-teach a subject than to teach it correctly the first time. For the trainees' first learning experience should be positive and functionally related to training.

Law of Intensity

The principle of intensity states that if the stimulus (experience) is real, the more likely there is to be a change in behavior (learning). A vivid, dramatic or exciting learning experience teaches more than a routine or boring experience. ***A trainee will learn more from the real thing than from a substitute.*** Demonstrations, skits, (jokes, a short literary piece of a humorous or satirical character) and models do much to intensify the learning experiences of trainees.

Law of Recency

Things most ***recently learned are best remembered***, while the ***things learned some time ago are remembered with more difficulty***. It is sometimes easy, for example, to recall a telephone number dialed a few minutes ago, but it is usually impossible to

recall a telephone number dialed a week ago. Review, warm-ups, and similar activities are all based on the principle that the more recent the exercise, the more effective the performance. Practicing a skill or new concept just before using it will ensure a more effective performance. Instructors recognize the law of recency when they plan a lesson summary or a conclusion of the lecture. Repeat, restate, or reemphasize important matters at the end of a lesson to make sure that trainees remember them instead of inconsequential details.

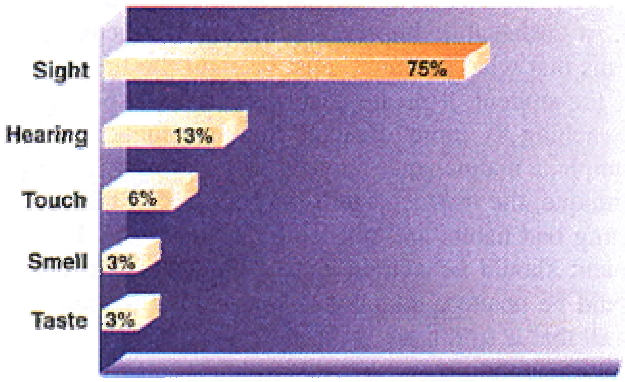


Figure 1-2. Most learning occurs through sight, but the combination of sight and hearing accounts for about 88 percent of all perceptions.

3.2. How People Learn

Initially, all learning comes from perceptions which are directed to the brain by one or more of the five senses: sight, hearing, touch, smell, and taste. Psychologists have also found that learning occurs most rapidly when information is received through more than one sense.

Perceptions

Perceiving involves more than the reception of stimuli from the five senses. Perceptions result when a person gives meaning to sensations. People base their actions on the way they believe things to be. The experienced aviation maintenance technician, for example, perceives an engine malfunction quite differently than does an inexperienced student. Real meaning comes only from within a person, even though the perceptions which evoke these meanings result from external stimuli. The meanings which are derived from perceptions are influenced not only by the individual's experience, but also by many other factors. Knowledge of the factors which affect the perceptual process is very important to the aviation instructor because **perceptions** are the basis of all learning.

Factors Which Affect Perception

There are several factors that affect an individual's ability to perceive. Some are internal to each person and some are external.

- **Physical organism**

- **Basic need**
- **Goals and values**
- **Self-concept**
- **Time and opportunity**
- **Element of threat**

Physical Organism

The **physical organism** provides individuals with the perceptual apparatus for sensing the world around them. Pilots, for example, must be able to see, hear, feel, and respond adequately while they are in the air. A person whose perceptual apparatus distorts reality is denied the right to fly at the time of the first medical examination.

Basic Need

A person's **basic need** is to maintain and enhance the organized self. The self is a person's past, present, and future combined; it is both physical and psychological. A person's most fundamental, pressing need is to preserve and perpetuate the self. All perceptions are affected by this need. Just as the food one eats and the air one breathes become part of the physical self, so do the sights one sees and the sounds one hears become part of the psychological self. Psychologically, we are what we perceive. A person has physical barriers which keep out those things that would be damaging to the physical being, such as blinking at an arc weld or flinching from a hot iron. Likewise, a person has perceptual barriers that block those sights, sounds, and feelings which pose a psychological threat.

Helping people learn requires finding ways to aid them in developing better perceptions in spite of their defense mechanisms. Since a person's basic need is to maintain and enhance the self, the instructor must recognize that anything that is asked of the student which may be interpreted by the student as imperiling the self will be resisted or denied. To teach effectively, it is necessary to work with this life force.

Goals and Values

Perceptions depend on one's **goals and values**. Every experience and sensation which is funneled into one's central nervous system is colored by the individual's own beliefs and value structures. Spectators at a ball game may see an infraction or foul differently depending on which team they support. The precise kinds of commitments and philosophical outlooks which the student holds are important for the instructor to know, since this knowledge will assist in predicting how the student will interpret experiences and instructions.

Goals are also a product of one's value structure. Those things which are more highly valued and cherished are pursued; those which are accorded less value and importance are not sought after.

Self-Concept

Self-concept is a powerful determinant in learning. A student's self-image, described in such terms as confident and insecure, has a great influence on the total perceptual process. lf a student's experiences tend to support a favorable self-image, the student tends to remain receptive to subsequent experiences. lf a student has negative experiences which tend to contradict self-concept, there is a tendency to reject additional training.

A negative self-concept inhibits the perceptual processes by introducing psychological barriers which tend to keep the student from perceiving. They may also inhibit the ability to properly implement that which is perceived. That is, self-concept affects the ability to actually perform or do things unfavorable. Students who view themselves positively, on the other hand, are less defensive and more receptive to new experiences, instructions, and demonstrations.

Time and Opportunity

It takes **time and opportunity** to perceive. Learning some things depends on other perceptions which have preceded these learnings, and on the availability of time to sense and relate these new things to the earlier perceptions. Thus, sequence and time are necessary.

A student could probably stall an airplane on the first attempt, regardless of previous experience. Stalls cannot really be learned, however, unless some experience in normal flight has been acquired. Even with such experience, time and practice are needed to relate the new sensations and experiences associated with stalls in order to develop a perception of the stall. In general, lengthening an experience and increasing its frequency are the most obvious ways to speed up learning, although this is not always effective. Many factors, in addition to the length and frequency of training periods, affect the rate of learning. The effectiveness of the use of a properly planned training syllabus is proportional to the consideration it gives to the time and opportunity factor in perception.

Element of Threat

The **element of threat** does not promote effective learning. In fact, fear adversely affects perception by narrowing the perceptual field. Confronted with threat, students tend to limit their attention to the threatening object or condition. The field of vision is reduced, for example, when an individual is frightened and all the perceptual faculties are focused on the thing that has generated fear.

Learning is a psychological process, not necessarily a logical one. Trying to frighten a student through threats of unsatisfactory reports or reprisals may seem logical, but is not effective psychologically. The effective instructor can organize teaching to fit the psychological needs of the student. If a situation seems overwhelming, the student feels unable to handle all of the factors involved, and a threat exists. So long as the

student feels capable of coping with a situation, each new experience is viewed as a challenge.

A good instructor realizes that behavior is directly influenced by the way a student perceives, and perception is affected by all of these factors. Therefore, it is important for the instructor to facilitate the learning process by avoiding any actions which may inhibit or prevent the attainment of teaching goals. Teaching is consistently effective only when those factors which influence perceptions are recognized and taken into account.

Insight

Insight involves the grouping of perceptions into meaningful wholes. Creating insight is one of the instructor's major responsibilities. To ensure that this does occur, it is essential to keep each student constantly receptive to new experiences and to help the student realize the way each piece relates to all other pieces of the total pattern of the task to be learned.

True learning requires an understanding of how each of these factors may affect all of the others and, at the same time, knowledge of how a change in any one of them may affect all of the others. This mental relating and grouping of associated perceptions is called insight.

Insight will almost always occur eventually, whether or not instruction is provided. For this reason, it is possible for a person to become an electrician by trial and error, just as one may become a lawyer by reading law. Instruction, however, speeds this learning process by teaching the relationship of perceptions as they occur, thus promoting the development of the student's insight.

As perceptions increase in number and are assembled by the student into larger blocks of learning, they develop insight. As a result, learning becomes more meaningful and more permanent. Forgetting is less of a problem when there are more anchor points for tying insights together. It is a major responsibility of the instructor to organize demonstrations and explanations, and to direct practice, so that the student has better opportunities to understand the interrelationship of the many kinds of experiences that have been perceived. Pointing out the relationships as they occur, providing a secure and nonthreatening environment in which to learn, and helping the student acquire and maintain a favorable self-concept are key steps in fostering the development of insight.

Motivation

Motivation is probably the dominant force which governs the student's progress and ability to learn. Motivation may be negative or positive, tangible or intangible, subtle and difficult to identify, or it may be obvious.

Negative motivation may engender fear, and be perceived by the student as a threat. While negative motivation may be useful in certain situations, characteristically it is not as effective in promoting efficient learning as positive motivation.

Positive motivation is provided by the promise or achievement of rewards. These rewards may be personal or social; they may involve financial gain, satisfaction of the self-concept, or public recognition. Motivation which can be used to advantage by the instructor includes the desire for personal gain, the desire for personal comfort or security, the desire for group approval, and the achievement of a favorable self-image.

The desire for personal gain, either the acquisition of possessions or status, is a basic motivational factor for all human endeavor. An individual may be motivated to dig a ditch or to design a supersonic airplane solely by the desire for financial gain.

Students are like typical employees in wanting a tangible return for their efforts. For motivation to be effective, students must believe that their efforts will be suitably rewarded. These rewards must be constantly apparent to the student during instruction, whether they are to be financial, self-esteem, or public recognition.

Lessons often have objectives which are not obvious at first. Although these lessons will pay dividends during later instruction, the student may not appreciate this fact. It is important for the instructor to make the student aware of those applications which are not immediately apparent. Likewise, the devotion of too much time and effort to drill and practice on operations which do not directly contribute to competent performance should be avoided. The desire for personal comfort and security is a form of motivation which instructors often forget. All students want secure, pleasant conditions and a safe environment. If they recognize that what they are learning may promote these objectives, their attention is easier to attract and hold. Insecure and unpleasant training situations inhibit learning.

Everyone wants to avoid pain and injury. Students normally are eager to learn operations or procedures which help prevent injury or loss of life. This is especially true when the student knows that the ability to make timely decisions, or to act correctly in an emergency, is based on sound principles.

The attractive features of the activity to be learned also can be a strong motivational factor. Students are anxious to learn skills which may be used to their advantage. If they understand that each task will be useful in preparing for future activities, they will be more willing to pursue it.

Another strong motivating force is group approval. Every person wants the approval of peers and superiors. Interest can be stimulated and maintained by building on this natural desire. Most students enjoy the feeling of belonging to a group and are interested in accomplishment which will give them prestige among their fellow students.

Every person seeks to establish a favorable self-image. In certain instances, this self-image may be submerged in feelings of insecurity or despondency. Fortunately, most people engaged in a task believe that success is possible under the right combination of circumstances and good fortune. This belief can be a powerful motivating force for students. An instructor can effectively foster this motivation by the introduction of perceptions which are solidly based on previously learned factual information that is easily recognized by the student. Each additional block of learning should help formulate insight which contributes to the ultimate training goals. This promotes student confidence in the overall training program and, at the same time, helps the student develop a favorable self-image. As this confirmation progresses and confidence increases, advances will be more rapid and motivation will be strengthened.

Levels of Learning

Levels of learning may be classified in any number of ways. The lowest level is the ability to repeat something which one has been taught, without understanding or being able to apply what has been learned. This is referred to as **rote learning**. Progressively higher levels of learning are **understanding** what has been taught, achieving the skill for **application** of what has been learned, and **correlation** of what has been learned with other things previously learned or subsequently encountered.

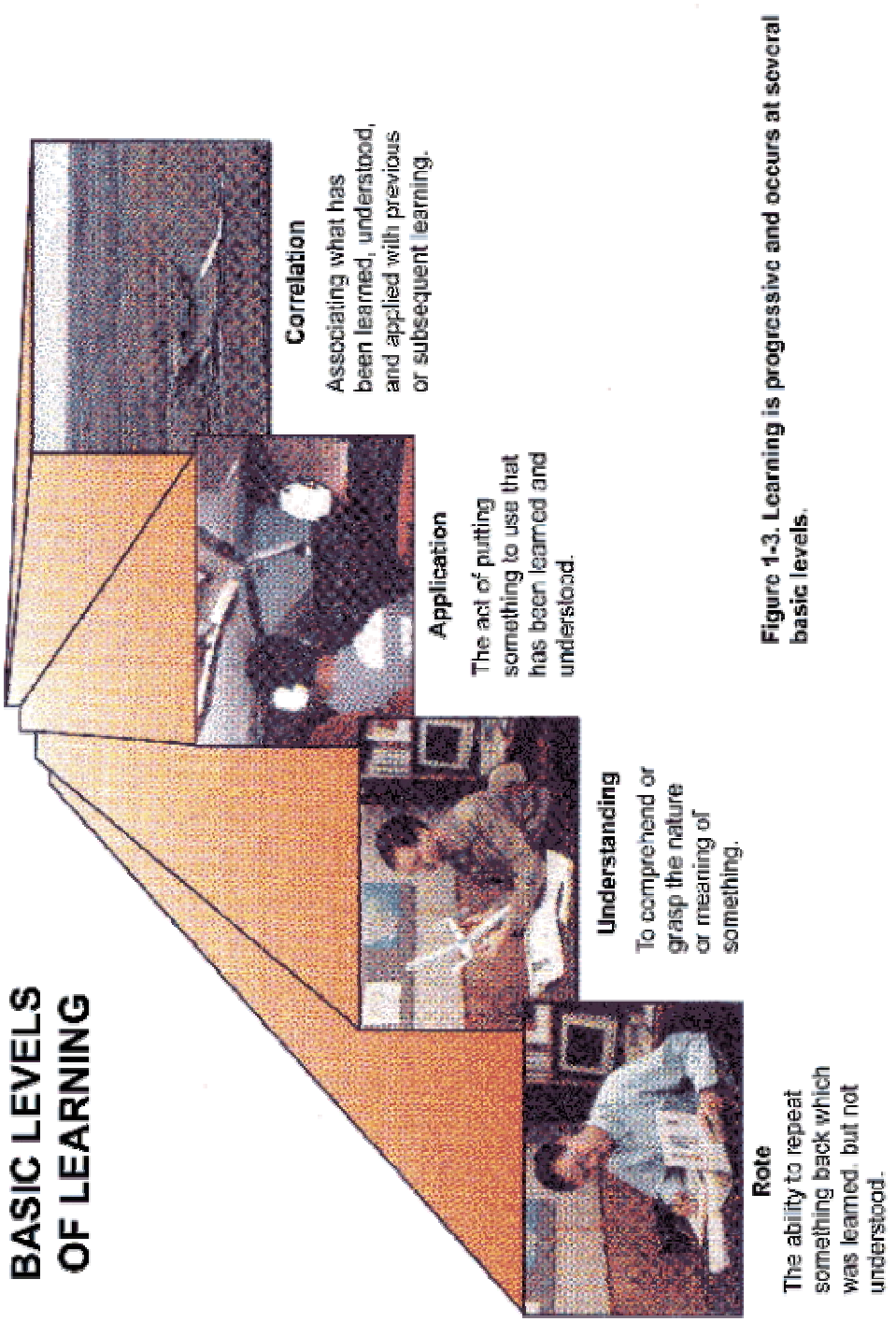


Figure 1-3. Learning is progressive and occurs at several basic levels.

3.3. The Conservative or Cultural Aim of Education:

One of the important functions of education ***is the conservation of culture through education***.

Continuity in man's social life is possible through this process. The valuable cultural heritage which has accumulated a vast store of human knowledge and experience is transmitted to the coming generation through education. Otherwise each generation would have to go over them again culture includes arts, science, religions and the

social customs developed gradually by many people contributing to it. It has to be conserved and transmitted to the youth for their own benefits. Past experiences are useful in learning new ones.

Progressive Aim of Education:

Education is not only necessary for the conservation of the culture, but is also essential for its progress. The dynamic force of education operates in this direction. Man has been moving on the way of progress since the beginning of the world. Possessing a superior nervous system, he discovered and invented ways and means for making his life more comfortable.

Education enhances his efficiency for exploring and utilizing the natural resources around him. Dewey (**John Dewey** (October 20, 1859 – June 1, 1952) was an American philosopher, psychologist and whose ideas have been influential in education and social reform) has propounded the theory that the main purpose of education is to modify the behavior of the child in such a way that he may be able to adjust himself to his environment and to modify his environment to accord with his own.

Education for Citizenship:

In the Greek City state of Athens for the first time emerged educational aims that were not merely conservative but progressive as well. The Athenians were able to do so as their successful worse with Persia brought them prosperity. The great Greek philosophers Plato and Aristotle stressed that ***the aim of education should be the production of good citizens***. Thus the Greek educational idea was to produce good citizens. The good citizen was on who developed all his capabilities harmoniously. He aimed to learn the virtues of good citizenship. That is to be temperate, brave and just. To Aristotle, ***a citizen was primarily a freeman and a befitting education***. ***The chief aim of liberal education was the cultivation of intellect, and bringing happiness in the lives of people.***

The rhetorician's educational ideal of the citizen differed some what from that of the philosophers. To them, a citizen was a gentleman of culture and polish.

To Roman, also the chief educational aim was the cultivation of the ideal citizen their education aimed at the inoculation of the desirable qualities of a citizen among the students; qualities such as firmness, bravery, respect for the Gods. Self-restraint, dignity and justice etc.

Social Efficiency as an Aim of Education:

The aim of social efficiency is identical with the progressive aim of education presented by John Dewy (1859-1952), the American Pragmatist, according to him, educational aims were the out growth of problematic situations arising in ongoing activities. The child has to develop social efficiency and learn skills for proper adjustment in his everyday life. Dewey and his followers from the educational aims

taking into consideration both the uniqueness of the individual and the uniqueness of the circumstances in which he finds himself.

In the modern age, social efficiency is considered as one of the greatest skills in human beings. ***Education should enable the child to participate constructively in democratic group life and to play different roles of life effectively and efficiently***. Social growth or the development of social efficiency in a child is a very significant process. A child social efficiency or inefficiency affects his entire life. He lives in a complicated world and education should enable him to meet the challenges of this dynamic world successfully. Efficiency in social adjustment is a most sought for quality in the modern times. According to Dewy the process of education has psychological as well as sociological aspects. The psychological aspects are the basis of whole process and the teacher has to consider the nature. Interest and potentialities or endowments of the learners.

Vocational Aim of Education:

The idea that education should enable a person to earn his livelihood exists since antiquity the primitive people taught skills to their young generation with this purpose. But Plato consider this aim as mean and illiberal because education during that period was meant for the nobles only and was received with an ornamental purpose with the advancement of knowledge and progress in industry and technology, education began to be considered more useful rather than ornamental. With the spread of democratic ideas, society today demands a utilitarian type of education for all and not just the ornamental type of education for a few. In this pragmatic world, people believe more in the utility of knowledge them ever before and knowledge for the sake of knowledge remains the ideal of only a handful of individuals.

Social efficiency is an established aim of education, and vocational efficiency is a major factor in obtaining it; people able to earn their livelihood, do not become parasites upon the society. Unfortunately, in the history of education of the subcontinent, vocational aim has been ignored for long.

Knowledge as an Aim of Education:

Some educationist advocated acquisition of knowledge as an aim of education Socrates held this view, as he considered knowledge as virtue. Aristotle expounded this view and added that knowledge of something is not enough, but virtue consists in proper actions, these emphasizing the functional aspect of knowledge. Comenivs favored the acquisition of all the domain of knowledge by able and efficient people. Adam criticize this idea very much as in his opinion, this aim leads the schools to turn into knowledge shops and teachers into information mongers while children do nothing except receiving the mass of information. No doubt knowledge has an essential place in the process of education, but many people do not consider the acquisition of knowledge per se as an aim. Various aims advocated by different thinkers at different times could be obtained through knowledge. Aims and objectives

set by the idealists (a person who cherishes or pursues high or noble principles, purposes, goals, etc.), naturalists (a person who is expert or interested in botany or zoology, esp in the field) and pragmatists (a person who is oriented toward the success or failure of a particular line of action, thought, etc.; a practical person) were to be realized through knowledge only. Any job, even the manual work, cannot be done properly without a knowledge of it.

Personality development as an aim of Education:

The most accepted, comprehensive and modern aim of education is the proper development of the personality of the student. It implies development in all the aspects of their life, that is mental, physical, social and even emotional.

The Greeks provided education for the development of a 'sound mind in sound body'; gymnastics for the body and other subjects for the mind. Moral results were also obtained through physical training.

Plato said that nothing should be taught to children which were not conducive to the promotion of virtue in them. Intelligence plays a major role in the process of learning, hence the development of the intellect is told as one aim of education by many people. Educators are of the opinion that one aspect of the human life should not be developed at the expense of the others; instead development should be in all directions to result ultimately in the development of entire personality.

Aristotle prescribed happiness in life as an aim of education, but this is not possible without a desirable personality development the same is applicable with the aim of complete living. Put for word by Herbort Spencer, education like Rouseau, Pestalozzi, Dewey, Ibn-e-Khildom and Imam Ghazali and reformers like Dr. Mohammad Iqbal and Sir Syed Ahmed Khan have emphasized the development of the perosnality of the learner through education. The aim is considered valid throughout the world and will remain thus forever in the future.

3.4. Bloom's (1956) *Taxonomy of Educational Objectives* is the most renowned description of the levels of cognitive performance. The levels of this taxonomy are considered to be hierarchical. That is, ***learners must master lower level objectives*** first before they can build on them to reach ***higher level objectives***. **Bloom's Taxonomy (таксономія, систематика)** is a classification of learning objectives within education. It refers to a classification of the different objectives that educators set for students (learning objectives). The taxonomy was first presented in 1956 through the publication *The Taxonomy of Educational Objectives, The Classification of Educational Goals, Handbook I: Cognitive Domain*, by Benjamin Bloom (editor), M. D. Englehart, E. J. Furst, W. H. Hill, and David Krathwohl. It is considered to be a foundational and essential element within the education community as evidenced in the 1981 survey *Significant writings that have influenced the curriculum: 1906-1981*, by H. G. Shane and the 1994 yearbook of the National Society for the Study of Education.

Bloom himself considered the Handbook, "one of the most widely cited yet least read books in American education". **The Three Types of Learning:**

There is more than one type of learning. A committee of colleges, led by Benjamin Bloom (1956), identified three domains of educational activities:

- **Cognitive**: mental skills (*Knowledge*)
- **Affective**: growth in feelings or emotional areas (*Attitude*)
- **Psychomotor**: manual or physical skills (*Skills*)

Domains can be thought of as categories. Trainers often refer to these three categories as ***KSA*** (***Knowledge, Skills, and Attitude***). This taxonomy of learning behaviors can be thought of as "the goals of the learning process." That is, after a learning episode, the learner should have acquired new skills, knowledge, and/or attitudes.

This compilation divides the three domains into subdivisions, starting from the simplest behavior to the most complex. The divisions outlined are not absolutes and there are other systems or hierarchies that have been devised in the educational and training world. However, Bloom's taxonomy is easily understood and is probably the most widely applied one in use today.

Bloom's Taxonomy of Educational Objectives

There are six major categories (levels) in the taxonomy, starting from the simplest behavior to the most complex. The categories can be thought of as degrees of difficulties, moving through the lowest order processes to the highest.

The ***cognitive domain*** (Bloom, 1956) involves knowledge and the development of intellectual skills. This includes the recall or recognition of specific facts, procedural patterns, and concepts that serve in the development of intellectual abilities and skills. That is, the first one must be mastered before the next one can take place. In the **cognitive domain** revolve around knowledge, comprehension, and critical thinking of a particular topic. Traditional education tends to emphasize the skills in this domain, particularly the lower-order objectives.

nce. Tee *Taxonomy* and examples of activities at each level are given in ***T***

1. ***Knowledge*** (Remembering previously learned material) Knowledge of specifics - terminology, specific facts

- Knowledge of ways and means of dealing with specifics - conventions, trends and sequences, classifications and categories, criteria, methodology
- Knowledge of the universals and abstractions in a field - principles and generalizations, theories and structures

Questions like: What are the health benefits of eating apples?

Educational Psychology: Give the definition of punishment.

Mathematics: State the formula for the area of a circle.

English / Language Arts: Recite a poem.

B ***2. Comprehension*** (Grasping the meaning of material)

Demonstrative understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions, and stating main ideas

- Translation
- Interpretation
- Extrapolation

Questions like: Compare the health benefits of eating apples vs. oranges.

Educational Psychology: Paraphrase in your own words the definition of punishment; answer questions about the meaning of punishment.

Mathematics: Given the mathematical formula for the area of a circle, paraphrase it using your own words.

English / Language Arts: Explain what a poem means.

le 3. Application (Using information in concrete situations)

Using new knowledge. Solve problems to new situations by applying acquired knowledge, facts, techniques and rules in a different way

Questions like: Which kinds of apples are best for baking a pie, and why?

Educational Psychology: Given an anecdote describing a teaching situation, identify examples of punishment.

Mathematics: Compute the area of actual circles.

English / Language Arts: Identify examples of metaphors in a poem.

4. Analysis (Breaking down material into parts)

Examine and break information into parts by identifying motives or causes. Make inferences and find evidence to support generalizations

- Analysis of elements
- Analysis of relationships
- Analysis of organizational principles

Questions like: List four ways of serving foods made with apples and explain which ones have the highest health benefits. Provide references to support your statements.

Educational Psychology: Given an anecdote describing a teaching situation, identify the psychological strategies intentionally or accidentally employed.

Mathematics: Given a math word problem, determine the strategies that would be necessary to solve it.

English / Language Arts: Given a poem, identify the specific poetic strategies employed in it.

5. Synthesis (Putting parts together into a whole)

Compile information together in a different way by combining elements in a new pattern or proposing alternative solutions

- Production of a unique communication
- Production of a plan, or proposed set of operations
- Derivation of a set of abstract relations

Questions like: Convert an "unhealthy" recipe for apple pie to a "healthy" recipe by replacing your choice of ingredients. Explain the health benefits of using the ingredients you chose vs. the original ones.

Educational Psychology: Apply the strategies learned in educational psychology in an organized manner to solve an educational problem.

Mathematics: Apply and integrate several different strategies to solve a mathematical problem.

English / Language Arts: Write an essay or a poem.

6. Evaluation (Judging the value of a product for a given purpose, using definite criteria)

Present and defend opinions by making judgments about information, validity of ideas or quality of work based on a set of criteria

- Judgments in terms of internal evidence
- Judgments in terms of external criteria

Questions like: Do you feel that serving apple pie for an after school snack for children is healthy? Why or why not?

Educational Psychology: Observe another teacher (or yourself) and determine the quality of the teaching performance in terms of the teacher's appropriate application of principles of educational psychology.

Mathematics: When you have finished solving a problem (or when a peer has done so) determine the degree to which that problem was solved as efficiently as possible.

English / Language Arts: Analyze your own or a peer's essay in terms of the principles of composition discussed during the semester.

The main value of the *Taxonomy* is ***twofold***: (1) it can stimulate teachers to help students acquire skills at all of these various levels, laying the proper foundation for higher levels by first assuring mastery of lower-level objectives; and (2) it provides a basis for developing measurement strategies to assess student performance at all these levels of learning.

The Affective domain

Skills in the **affective domain** describe the way people react emotionally and their ability to feel another living thing's pain or joy. Affective objectives typically target the awareness and growth in attitudes, emotion, and feelings. The affective domain (Krathwohl, Bloom, Masia, 1973) includes the manner in which we deal with things emotionally, such as feelings, values, appreciation, enthusiasms, motivations, and attitudes. The five major categories are listed from the simplest behavior to the most complex:

Receiving
: The lowest level; the student passively pays attention. Without this level no learning can occur.

Responding
: The student actively participates in the learning process, not only attends to a stimulus; the student also reacts in some way.

Valuing
: The student attaches a value to an object, phenomenon, or piece of information.

Organizing
: The student can put together different values, information, and ideas and accommodate them within his/her own schema; comparing, relating and elaborating on what has been learned.

Characterizing
: The student holds a particular value or belief that now exerts influence on his/her behaviour so that it becomes a characteristic.

The Psychomotor domain

The psychomotor domain includes physical movement, coordination, and use of the motor-skill areas. Development of these skills requires practice and is measured in terms of speed, precision, distance, procedures, or techniques in execution. Skills in the **psychomotor domain** describe the ability to physically manipulate a tool or instrument like a hand or a hammer. Psychomotor objectives usually focus on change and/or development in behavior and/or skills. Simpson (1972) among other contributors, such as Harrow (1972) and Dave (1975) created a Psychomotor Taxonomy that helps to explain the behavior of typical learners or high performance athletes. The ***seven major categories*** are listed from the simplest behavior to the most complex:

1. **Perception**: *The ability to use sensory cues to guide motor activity*. This ranges from sensory stimulation, through cue selection, to translation. Examples: Detects non-verbal communication cues. Estimate where a ball will land after it is thrown and then moving to the correct location to catch the ball. Adjusts heat of stove to correct temperature by smell and taste of food. Adjusts the height of the forks on a forklift by comparing where the forks are in relation to the pallet. Key Words: chooses, describes, detects, differentiates, distinguishes, identifies, isolates, relates, selects.

2. **Set**: Readiness to act. *It includes mental, physical, and emotional sets. These three sets are dispositions that predetermine a person's response to different situations* (sometimes called mindsets). Examples: Knows and acts upon a sequence of steps in a manufacturing process. Recognize one's abilities and limitations. Shows desire to learn a new process (motivation). NOTE: This subdivision of Psychomotor is closely related with the "Responding to phenomena" subdivision of the Affective domain. Key Words: begins, displays, explains, moves, proceeds, reacts, shows, states, volunteers.

3. **Guided Response**: *The early stages in learning a complex skill that includes imitation and trial and error. Adequacy of performance is achieved by practicing*. Examples: Performs a mathematical equation as demonstrated. Follows instructions to build a model. Responds hand-signals of instructor while learning to operate a forklift. Key Words: copies, traces, follows, react, reproduce, responds

4. **Mechanism**: This is the intermediate stage in learning a complex skill. *Learned responses have become habitual and the movements can be performed with some confidence and proficiency*. Examples: Use a personal computer. Repair a leaking faucet. Drive a car. Key Words: assembles, calibrates, constructs, dismantles, displays, fastens, fixes, grinds, heats, manipulates, measures, mends, mixes, organizes, sketches.

5. **Complex Overt Response**: *The skillful performance of motor acts that involve complex movement patterns*. Proficiency is indicated by a quick, accurate, and highly coordinated performance, requiring a minimum of energy. This category includes performing without hesitation, and automatic performance. For example, players are

often utter sounds of satisfaction or expletives as soon as they hit a tennis ball or throw a football, because they can tell by the feel of the act what the result will produce. Examples: Maneuvers a car into a tight parallel parking spot. Operates a computer quickly and accurately. Displays competence while playing the piano. Key Words: assembles, builds, calibrates, constructs, dismantles, displays, fastens, fixes, grinds, heats, manipulates, measures, mends, mixes, organizes, sketches. NOTE: The Key Words are the same as Mechanism, but will have adverbs or adjectives that indicate that the performance is quicker, better, more accurate, etc.

6. **Adaptation**: *Skills are well developed and the individual can modify movement patterns to fit special requirements*. Examples: Responds effectively to unexpected experiences. Modifies instruction to meet the needs of the learners. Perform a task with a machine that it was not originally intended to do (machine is not damaged and there is no danger in performing the new task). Key Words: adapts, alters, changes, rearranges, reorganizes, revises, varies.

7. **Origination**: *Creating new movement patterns to fit a particular situation or specific problem*. Learning outcomes emphasize creativity based upon highly developed skills. Examples: Constructs a new theory. Develops a new and comprehensive training programming. Creates a new gymnastic routine. Key Words: arranges, builds, combines, composes, constructs, creates, designs, initiate, makes, originates. the full range of expectations within each topic. Since not all topics lend themselves to objec at every level of the *Taxonomy*, some of the cells in this matrix are blank; when higher level objectives occur with nothing at the lower level, the lower-level objectives would have to be learned in a different context.

3.5. THE PROCESS OF EDUCATION

- Ideally, interest in the material to be learned is the best stimulus to learning, rather than such external goals as grades or later competitive advantage.
- Not teaching devices, but teachers, are the principle agents of instruction and more importantly, learning.
- The first object of any act of learning, over and beyond the pleasure it may give, is that it should serve us in the future. Learning should not only take us somewhere; it should allow us later to go further more easily.
- Mastery of the fundamental ideas of a field involves not only the grasping of general principles, but also the development of a attitude toward leaning and inquiry, toward guessing and hunches, toward the possibility of solving problems on one's own.
- Unless detail is placed into a structured pattern, it is rapidly forgotten.
- At each stage of development a person has a characteristic way of viewing the world and explaining it to himself. The task of teaching a subject to a person at any particular developmental stage is one of representing the

structure of that subject in terms of the person's way of viewing things.

- Learning a subject seems to involve three almost simultaneous processes. First, there is *acquisition* of new information -- often information that runs counter to or is a replacement for what the person has previously known. A second aspect of learning may be called *transformation* -- the process of manipulating knowledge to make it fit new tasks. Transformation comprises the ways we deal with information in order to go beyond it. A third aspect of learning is *evaluation* -- checking whether the way we have manipulated information is adequate to the task.
- The quest, it seems to many, is to devise materials that will challenge the superior student while not destroying the confidence and the will-to-learn of those who are less fortunate. We have no illusions about the difficulty of such a course, yet it is the only one open to us if we are to pursue excellence and at the same time honor the diversity of talents we must educate.
- Somewhere between apathy and wild excitement, there is an optimum level of aroused attention that is ideal for classroom activity.
- Films, audio-visual aids and other such devices may have the short-run effect of catching attention. In the long run, they may produce a passive person waiting for some sort of curtain to go up to arouse him. The issue is particularly relevant in an entertainment oriented, mass-communication culture where passivity and "spectatorship" are dangers.
- If teaching is done well and what we teach is worth learning, there are forces at work that will provide the external prod (a stimulus or reminder) that will get people more involved in the process of learning than they were in the past.
- There is much discussion about how to give our schools a more serious intellectual tone, about the relative emphasis on athletics, popularity, and social life on the one hand and on scholarly application on the other.
- The teacher's tasks as communicator, model and identification figure can be supported by a wise use of a variety of devices that expand experience, clarify it, and give it personal significance.

Didactic Technology Applications

Didactic technology applications are educational technologies that are designed to teach specific facts or skills, typically in a lecture-like or workbook-like format in which the system controls what material will be presented to the student. Didactic modes include the following:

- **expository learning**, in which the system provides information.
- **demonstration**, in which the system displays a phenomenon.
- **practice**, in which the system requires the student to solve problems, answer questions, or engage in some other procedure.

Didactic technology applications are based on a transmission rather than constructivist model of instruction. For this reason, although they have found their place in education and have the greatest rate of adoption of all types of technology within schools thus far, they are unlikely to serve as a catalyst for restructuring education. The focus of drill-and-practice computer-assisted instruction (CAI) on basic skills allows little room for the presentation of complex tasks, multistep problems, or collaborative learning. Intelligent computer-assisted instruction (ICAI), on the other hand, has the potential to deal with complex domains, to provide models of higher-order thinking, and to probe students' understanding, but it is seldomly well integrated into a school's mainstream curriculum.

Teaching Methods in Education

There are many teaching methods in education that ***enhance the learning process of the students***.

Writing lesson plans is a foremost thing that a teacher must do before executing any teaching strategy in the class. The teaching method should be adopted on the basis of certain criteria like the knowledge of the students, the environment and the set of learning goals decided in the academic curriculum.

Students respond differently to different methods of teaching. Also, the students have their unique way of demonstrating the knowledge acquired and absorbing the information that is imparted. So, to aid this process of demonstrating the knowledge, the teacher has to adopt a technique that assists the students in retaining the information and increasing their understanding.
There are many teaching methods for children like questioning, modeling, demonstrating, collaborating and explaining that have been discussed here.

Teaching Methods and Strategies

We all know about the importance of higher education, so now let us learn some methods of teaching as well. Here are some of the basic teaching methods for higher education as well as for the middle education.

Questioning

Testing and questioning are always known to be effective teaching methods due to its interactive nature. The questions are asked by the teacher with an intention to know what the student has learnt from earlier discussions and what it helps in deciding what should be taught further. This can be even vice-verse, students questioning the teachers to clarify the doubts that would enhance their understanding of the subject. The inquisitive instinct of the students evoke them to askquestions and satiate their query.

The teacher should encourage this in a positive way so that the student's ***critical thinking is developed***. Testing differs in one aspect from questioning. Test in done in order to know about the previous knowledge and already taught things to the student.

Explaining
Explaining is one of the very important teaching methods in education. It has taken a form of lectures in teaching methods for higher education where the teacher presents the factual information in a direct and a logical way.

Sometimes the experiences can also be shared as a part of knowledge that would work as a source of inspiration for the students. While adopting this method the teacher should give an introduction and a proper summary. Make sure that the information is specific to the audience.

The explanation should be accompanied with suitable examples for the better understanding of the students. It is like a discourse on a particular subject or topic that is for the entire class or public. Explaining can be clubbed with the modeling process to be more effective and to have a long-lasting effect on the pupils.

Modeling
Modeling is a type of visual aid for teaching as well as learning. It is a known fact that human brain absorbs more and understands better when visual aid facilitates explanation. This method works ***on three criteria - observing, retaining and replicating***. The students learn more by observing the things and acquire it by imitating it time and again.

This is also known as reinforced behavior. This type of learning has very important role to play in the learning process especially during the childhood, though it can happen in any stage of life. This helps the students to visualize the things and, then hypothesize the solution.

Demonstrating
With the help of demonstrative teaching methods in education students get an opportunity to explore the various aspects and understand the theory from a different perspective. Demonstration is a step-by-step explanation along with their reasons and significance for the better understanding of the student. It enhances the student's understanding by practically applying the knowledge and sharpen their skills and hence, they become capable of identifying and organizing the subject matter in a more efficient way. Practical experimentation is a very good method used for demonstrating the subject.

Collaborating
Teamwork is a contemporary form of collaboration. The students are taught to work in a group that makes the instructing easier for the teacher. This method of teaching promotes a sense of mutual responsibility among the students. They learn to put in more effort to research for the topic and apply effective techniques to get the result.

This inculcates patience and develops an ability to critically analyze a subject. It gives an opportunity to the students to solve the problem by a healthy discussion and co-operation. This is what we call 'group discussions' which motivates the students to

perform in a team, show leadership skills and enhances the presentation capabilities as well. This is one of the best direct instructional methods.

The teaching methods for special education is a little different from the teaching methods and theories for others. The education is imparted to these students based on their strengths and weaknesses. The teachers cater to the special needs of the students like modification in the regular teaching program, use of supplementary aids that allows students to participate in the learningprocess. Apart from these defined methods, nowadays many other teaching methods in education are being adopted to give quality education. The methods like ***role-play, story or games, seminars, presentations, workshops, conferences, brainstorming, case study, educational trips and modern audio-visual aids like documentary films, computers, internet***, etc have been introduced in education. These new methods have increased the pace of learning and understanding. This also enhances the capability of the students to research and logically think for a given problem.

Lecture 4

Areas of psychology

4.1. Four psychological goals.
4.2. Major subfields of psychology. Its areas of specialization.
4.3. Psychology's Scientific Approach. Steps of the scientific Method. Research Methods in psychology.

Key words: *description, explanation, prediction and changing behavior, Biopsychology, Clinical Psychology, Developmental Psychology, Forensic Psychology, Industrial-Organizational Psychology, Personality Psychology, Social Psychology, School Psychology, Cross-cultural psychology, Sport psychology, psychology's scientific approach, Hypothesis, Variable, Operational Definition, Descriptive research, Correlational research, Experimental research, case study, observation, interview, Survey methodology, Standardized tests*

4.1. Psychology is the social science of the human mind and its interaction with its environment. Since its modern development in the 19th century, psychology has developed into an analytical and predictive science with numerous subfields. Psychology has made significant advances by focusing on its core goals: ***description, explanation, prediction and changing behavior.***

Description

1. By describing behavior, psychologists attempt to understand what is normal and acceptable and what is unhealthy. Behavior observed includes thoughts, feelings, attitudes, goals, motivation, actions and reactions. Psychologists explain human behavior through methods such as case studies, observation, surveys, testing and correlational studies.

Explanation

2. Psychologists' attempts to explain behavior reflect the fundamental goal of all science--understanding our universe and our place in it. Several theorists, from Freud and Jung to Skinner and Rogers, have offered various theories to explain personality, development and motivation. Explanations are limited, of course, because they often are culturally restricted; that is, one explanation might not explain similar behavior in another culture or society. Explanation is often determined through qualitative and quantitative observation, including experimentation.

Prediction

3. Psychology also attempts to predict behavior. The purpose of prediction is to determine when an individual will make healthy or unhealthy choices or how an individual will perform within environment and stimuli. Consider the advantages of

predicting whether a student will be successful at a certain college, based on past behavior in a similar environment. Though prediction is not foolproof, it can permit institutions and individuals to make more informed decisions choices about their futures.

Changing Behavior

4. Modifying behavior can be healthy or unhealthy, but within ethical constraints, psychology attempts to voluntarily encourage individuals and groups to modify behavior for long-term healthy gain. Personality and development theories differ as to how best to encourage behavior changes. Some behaviorists believe in repetitive reinforcement, while positivists believe in honest cognitive discourse. Psychology can be used in education, social correction and organizational structures to elicit preferred behavior and attitudes.

Limitations

5. As with any science, and especially in social science, psychology is limited within its own goals. The description of one individual, for example, cannot predict the behavior of a group. Using experimentation and statistical analysis and drawing upon multiple sources, psychology continues to develop, however, into a respected field of study that aims to benefit all of us.

4.2. The study and practice of psychology encompasses a vast range of topics and a large number of subfields and specialty areas have developed as a result. Because human behavior is so varied, the number of subfields in psychology is constantly growing and evolving.

Psychology can be roughly divided into two major sections: **research,** which seeks to increase our knowledge base, and **practice**, through which our knowledge is applied to solving problems in the real world.

Because psychology touches on a number of other subjects including biology, philosophy, anthropology, and sociology, new areas of research and practice are continually forming.

Biopsychology

- This area of psychology is known by a number of titles including behavioral neuroscience, psychobiology, and neuropsychology.
- Biopsychologists study the relationship between the brain and behavior, such as how the brain and nervous system impact our thoughts, feeling, and moods.
- This field can be thought of as a combination of basic psychology and neuroscience.

Clinical Psychology

- Clinical psychology is the largest specialty area in psychology.
- These psychologists apply psychological principles and research to assess, diagnose, and treat patients with mental and emotional illnesses.
- Clinicians often work in private practices, but many also work in community centers or at universities and colleges.

Developmental Psychology

- Developmental psychologists study the physical and cognitive development that occurs over the course of the lifespan.
- These psychologists generally specialize in an area such as infant, child, adolescent, or geriatric development, while others may study the effects of developmental delays.

Forensic Psychology

- Forensic psychologists apply psychological principles to legal issues. This may involve studying criminal behavior and treatments, or working directly in the court system.
- Forensic psychologists often conduct evaluations, screen witnesses, or provide testimony in court cases.

Industrial-Organizational Psychology

- Psychologists in this field apply psychological principles to research on workplace issues such as productivity and behavior.
- Some psychologists in this field work in areas such as human factors, ergonomics, and human-computer interaction.
- Research in this field is known as applied research because it seeks to solve real world problems.

Personality Psychology

- Personality psychologists study the characteristic patterns of thoughts, feelings, and behavior that make each person unique.
- These psychologists often work in academic settings as instructors or researchers.

Social Psychology

- Social psychologists study social behaviors, including how individual self-image and behavior is impacted by interactions with others.
- These psychologists often conduct research in academic setting, but others work in such areas such as advertising and government.

School Psychology

- School psychologists work within the educational system to help children with emotional, social, and academic issues.
- These psychologists collaborate with teachers, parents, and students to find solutions to academic, social, and emotional problems.
- Most school psychologists work in elementary and secondary schools, but others work in private clinics, hospitals, state agencies, and universities. Some go into private practice and serve as consultants, especially those with a doctoral degree in school psychology.

Cross-cultural psychology examines the role of culture in understanding behavior, thought and emotions. Cross-cultural psychologists compare the nature of psychological processes in different cultures, with a special interest in whether or not psychological phenomena are universal or culture specific.

Sport psychology is the field of psychology that applies psychology's principles to improving sport performance and enjoying sport participation.

4.3.

PSYCHOLOGY'S SCIENTIFIC APPROACH

The Scientific Method ***Research Methods***

Psychologists and other social scientists regularly propose explanations for human behavior. On a more informal level, people make judgments about the intentions, motivations and actions of others on a daily basis. The results of these studies are often reported in popular media, which leads many to wonder just how or why researchers arrived at the conclusions they did. In order to truly understand how psychologists and other researchers reach these conclusions, you need to know more about the research process that is used to study psychology and the basic steps that are utilized when conducting any type of psychological research. By knowing the steps of the scientific method, you can better understand the process researchers go through to arrive at conclusions about human behavior.

What Is the Scientific Method?

The goals of psychological studies are to describe, explain, predict and perhaps influence mental processes or behaviors. In order to do this, psychologists utilize the scientific method to conduct psychological research. The scientific method is a set of principles and procedures that are used by researchers to develop questions, collect data and reach conclusions. What are the goals of scientific research in psychology? Researchers seek not only to describe behaviors and explain why these behaviors

occur; they also strive to create research that can be used to predict and even change human behavior. Like other scientists, psychologists hold a "scientific attitude," meaning that every aspect of research is critically and skeptically examined, and all biases are purposefully ignored during the research process. As such, the scientific method plays an integral part in the process of psychological research.

The scientific method is a systematic approach to research that involves the use of critical observation and analysis as a means of drawing conclusions that explain the scientific findings resulting from testing a hypothesis based on initial observations. In other words, the scientific method involves the following steps:

1. Identifying a problem
2. Making an educated guess (or hypothesis) about a possible solution
3. Conducting an experiment to test the hypothesis
4. Analyzing and recording information collected during the experiment
5. Making a conclusion that explains the findings of the experiment.

Key Terms to Know

- Hypothesis: An educated guess about the possible relationship between two or more variables.
- Variable: A factor or element that can change in observable and measurable ways.
- Operational Definition: A full description of exactly how variables are defined, how they will be manipulated, and how they will be measured.

Before a researcher can begin, they must choose a topic to study. Once an area of interest has been chosen, the researchers must then conduct a thorough review of the existing literature on the subject. This review will provide valuable information about what has already been learned about the topic and what questions remain to be answered.

Identifying a Problem

This first step is more complicated than one might think. First, the researcher must decide on the topic to be studied. Once a topic is chosen, the researcher needs to review all existing literature covering the topic of choice, including academic journals, government studies and psychology books. Doing so will help the researcher to understand what is already known about his or her topic. Many psychologists also will conduct an initial survey to gather basic information. Once all background research is completed the researcher is ready to form a testable hypothesis.

Step 1. Forming (formulating) a Hypothesis

The first step of a psychological investigation is to identify an area of interest and develop a hypothesis that can then be tested. While a hypothesis is often described as a hunch or a guess, it is actually much more specific. A hypothesis can be defined as an educated guess about the relationship between two or more variables.

For example, a researcher might be interested in the relationship between study habits and test anxiety. They would then propose a hypothesis about how these two variables are related, such as "test anxiety decreases as a result of effective study habits."

In order to form a hypothesis, you must start by collecting as many observations about something as you can. Next, it is important to evaluate these observations and look for possible causes of the problem. Create a list of possible explanations that you might want to explore. After you have developed some possible hypotheses, it is important to think of ways that you could confirm or disprove each hypothesis through experimentation.

A hypothesis takes vague ideas and translates them into a specific prediction about the relationship between variables. A good hypothesis uses specific language to identify a predicted cause and effect in a research study.

Testing the Hypothesis

To test a hypothesis, a researcher needs to create a study that will produce evidence to prove the hypothesis right or wrong. Psychologists, like other scientists, use two main forms of research to collect data: descriptive research and experimental research. Descriptive research involves observing and recording behavior and then using the recorded information to draw a conclusion.

Correlational studies, which are similar to descriptive research, identify relationships or correlations between non-manipulated materials. In experimental research, the psychologist artificially changes one of the variables and observes how this affects the other unchanged variable.

Operational Definitions

Study habits and test anxiety are the two variables in this imaginary study. A variable is a factor or element that can be changed and manipulated in ways that are observable and measurable. However, the researcher must also define exactly what each variable is using what are known as operational definitions. These definitions explain how the variable will be manipulated and measured in the study.

In our previous example, a researcher might operationally define the variable 'test anxiety' as the results on a self-report measure of anxiety experienced during an exam. The variable ‘study habits’ might be defined by the amount of studying that actually occurs as measured by time.

Why do psychologists need to provide operational definitions for each variable? These precise descriptions of each variable are important because many things can be measured in a number of different ways. One of the basic principles of any type of scientific research is that the results must be replicable. By clearly detailing the

specifics of how the variables were measured and manipulated, other researchers can better understand the results and repeat the study if needed.

Some variables are more difficult than others to define. How would you operationally define a variable such as aggression? For obvious ethical reasons, researchers cannot create a situation in which a person behaves aggressively toward others. In order to measure this variable, the researcher must devise a measurement that assesses aggressive behavior without harming other people. In this situation, the researcher might utilize a simulated task to measure aggressiveness.

Step 2. Devise a Study and Collect Data Steps of the Scientific Method

The second step in a psychology study is to select the research methods that will be used and then collect the data. The research method a researcher chooses depends largely on exactly what they are studying. There are two basic types of research methods—descriptive research and experimental research.

Descriptive Research Methods

Descriptive research such as case studies, naturalistic observations and surveys are often used when it would be impossible or difficult to conduct an experiment. These methods are best used to describe different aspects of a behavior or psychological phenomenon. Once a researcher has collected data using descriptive methods, a correlational study can then be used to look at how the variables are related.

Experimental Research Methods

Experimental methods are used to demonstrate causal relationships between variables. In an experiment, the researcher systematically manipulates a variable of interest (known as the independent variable) and measures the effect on another variable (known as the dependent variable). Experimental methods can be used to determine the actual nature of the relationship. That is to say, if changes in one variable actually *cause* another to change.

Step 3 – Examine Data and Reach Conclusions (Analyzing Data and Drawing Conclusions)

Once a researcher has designed the study and collected the data, it is time to examine this information and draw conclusions about what has been found. Using statistics, researchers can summarize the data, analyze the results, and draw conclusions based on this evidence. So how does a researcher decide what the results of a study mean? Not only can statistical analysis support (or refute) the researcher's hypothesis; it can also be used to determine if the findings are statistically significant. When results are said to be statistically significant, it means that it is unlikely that these results are due to chance. Once all the information regarding the study has been compiled, it must be examined. Using statistics, the researcher can summarize findings and decide if they support the hypothesis and then draw a conclusion, which is often publicized in

academic journals.The scientific method is important in psychology research because it provides a clear and understandable means of using collected information to draw verifiable conclusions.

*Step 4 – **Report the Findings of the Study***

The final step in a psychology study is to report the findings. This is often done by writing up a description of the study and publishing the article in an academic or professional journal. The results of psychological studies can be seen in peer-reviewed journals such as *Psychological Bulletin*, the *Journal of Social Psychology*, *Developmental Psychology*, and many others.

Researchers:

- Provide a brief history and background on previous research,
- Present their hypothesis,
- Identify who participated in the study and how they were selected,
- Provide operational definitions for each variable,
- Describe the measures and procedures that were used to collect data,
- Explain how information collected was analyzed, and
- Discuss what the results mean.

Why is such a detailed record of a psychological study so important? By clearly explaining the steps and procedures used throughout the study, other researchers can then replicate the results. The editorial process employed by academic and professional journals ensures that each article that is submitted undergoes a thorough peer review, which helps ensure that the study is scientifically sound. Once published, the study becomes another piece of the existing puzzle of our knowledge base on that topic.

A wide range of research methods are used in psychology. These methods vary by the sources of information that are drawn on, how that information is sampled, and the types of instruments that are used in data collection. Methods also vary by whether they collect qualitative data, quantitative data or both.

Qualitative psychological research is where the research findings are not arrived at by statistical or other quantitative procedures. Quantitative psychological research is where the research findings result from mathematical modeling and statistical estimation or statistical inference. Since qualitative information can be handled as such statistically, the distinction relates to method, rather than the topic studied.

There are three main types of psychological research:

- Descriptive research
- Correlational research
- Experimental research

Descriptive research, also known as **statistical research**, describes data and characteristics about the population or phenomenon being studied. Descriptive research answers the questions *who*, *what*, *where*, *when* and *how*...

Although the data description is factual, accurate and systematic, the research cannot describe what caused a situation. Thus, Descriptive research cannot be used to create a *causal relationship*, where one variable affects another. In other words, descriptive research can be said to have a low requirement for internal validity.

The description is used for frequencies, averages and other statistical calculations. Often the best approach, prior to writing descriptive research, is to conduct a survey investigation. Qualitative research often has the aim of *description* and researchers may follow-up with examinations of why the observations exist and what the implications of the findings are.

In short **descriptive research** deals with everything that can be counted and studied. But there are always restrictions to that. Your research must have an impact to the lives of the people around you. For example, finding the most frequent disease that affects the children of a town. The reader of the research will know what to do to prevent that disease thus, more people will live a healthy life.

Correlation refers to any of a broad class of statistical relationships involving dependence.

Familiar examples of dependent phenomena include the correlation between the physical statures of parents and their offspring, and the correlation between the demand for a product and its price. Correlations are useful because they can indicate a predictive relationship that can be exploited in practice. For example, an electrical utility may produce less power on a mild day based on the correlation between electricity demand and weather. In this example there is a causal relationship, because extreme weather causes people to use more electricity for heating or cooling; however, statistical dependence is not sufficient to demonstrate the presence of such a causal relationship.

An **experiment** is a methodical procedure carried out with the goal of verifying, falsifying, or establishing the validity of a hypothesis. Experiments vary greatly in their goal and scale, but always rely on repeatable procedure and logical analysis of the results. A child may carry out basic experiments to understand the nature of gravity, while teams of scientists may take years of systematic investigation to advance the understanding of a phenomenon.

An **experiment** is a method of testing - with the goal of explaining - the nature of reality. Experiments can vary from personal and informal (e.g. tasting a range of chocolates to find a favourite), to highly controlled (e.g. tests requiring complex apparatus overseen by many scientists hoping to discover information about subatomic particles).

Experiment is the step in the scientific method that arbitrates between competing models or hypotheses. Experimentation is also used to test existing theories or new hypotheses in order to support them or disprove them. An experiment or test can be carried out using the scientific method to answer a question or investigate a problem. First an observation is made. **Observation** is either an activity of a living being, such as a human, consisting of receiving knowledge of the outside world through the senses, or the recording of data using scientific instruments. The term may also refer to any data collected during this activity. An observation can also be the way you look at things or when you look at something. Then a question is asked, or a problem arises. Next, a hypothesis is formed. Then experiment is used to test that hypothesis. The results are analyzed, a conclusion is drawn, sometimes a theory is formed, and results are communicated through research papers.

The following are common research designs and data collection methods:

1.A **case study** is an intensive analysis of an individual unit (e.g., a person, group, or event) stressing developmental factors in relation to context;

2. **Observation** is either an activity of a living being, such as a human, consisting of receiving knowledge of the outside world through the senses, or the recording of data using scientific instruments. The term may also refer to any data collected during this activity. An observation can also be the way you look at things or when you look at something.

3. An **interview** is a conversation between two people (the interviewer and the interviewee) where questions are asked by the interviewer to obtain information from the interviewee.The qualitative research interview seeks to describe and the meanings of central themes in the life world of the subjects. The main task in interviewing is to understand the meaning of what the interviewees say.

Types of interviews

- **Informal, conversational interview** -no predetermined questions are asked, in order to remain as open and adaptable as possible to the interviewee's nature and priorities; during the interview the interviewer "goes with the flow".
- **General interview guide approach** -the guide approach is intended to ensure that the same general areas of information are collected from each interviewee; this provides more focus than the conversational approach, but still allows a degree of freedom and adaptability in getting the information from the interviewee.
- **Standardized, open-ended interview** -the same open-ended questions are asked to all interviewees; this approach facilitates faster interviews that can be more easily analyzed and compared.
- **Closed, fixed-response interview** -where all interviewees are asked the same questions and asked to choose answers from among the same set of alternatives. This format is useful for those not practiced in interviewing.

4. **Survey methodology** is the field that studies surveys, that is, the sample of individuals from a population with a view towards making statistical inferences about the population using the sample. Polls about public opinion, such as political beliefs, are reported in the news media in democracies. Other surveys are used for scientific purposes. Surveys provide important information for all kinds of research fields, e.g., marketing research, psychology, health professionals and sociology.
5. **Standardized tests** are used in psychology, as well as in everyday life, to measure intelligence, aptitude, achievement, personality, attitudes and interests. Standardized tests are used to produce norms-or statistical standards-that provide a basis for comparisons among individual members of the group of subjects. Tests must be standardized, reliable (give consistent results), and valid (reproducible) before they can be considered useful psychological tools. Standardized tests are highly controversial both in psychological circles and particularly in education because true standardization is difficult to attain. Certain requirements must be rigidly enforced. For example, subjects must be given exactly the same amount of time to take the test. Directions must be given using precisely the same wording from group to group, with no embellishments, encouragement, or warnings. Scoring must be exact and consistent. Even an unwitting joke spoken by the test administrator that relaxes the subjects or giving a test in a room that is too hot or too cold could be considered violations of standardization specifications. Because of the difficulty of meeting such stringent standards, standardized tests are widely criticized. Critics of the use of standardized tests for measuring educational achievement or classifying children are critical for other reasons as well. They say the establishment of norms does not give enough specific information about what children know. Rather, they reveal the average level of knowledge. Secondly, critics contend that such tests encourage educators and the public to focus their attention on groups rather than on individuals. Improving tests scores to enhance public image or achieve public funding become more of a focus than teaching individual children the skills they need to advance. Another criticism is that the tests, by nature, cannot measure knowledge of complex skills such as problem solving and critical thinking. "Teaching to the test"-drilling students in how to answer fill-in-the-blank or multiple-choice questions-takes precedence over instruction in more practical, less objective skills such as writing or logic.

Lecture 5

The Psychology of Communication

5.1. On the limits of the process of communication.

5.2. The main stages of communication process.

5.3. Modes of communication.

5.4. Types of non-verbal communication.

5.5. Models of communication process.

Key notions: *psychology of communication, Direct and Indirect communication, Verbal and non-verbal communication, Absorption stage, Interpretation stage, Reaction stage, Long distance communication methods, direct face to face communication, Paralinguistics, Proxemics, Haptics, Shannon's (1948) model of the communication process, Derivative Models of the Communication Process, Ecological Model of the Communication Process*

5.1. Communication is about using symbols and in case of humans, using language, to convey meanings and ideas between individuals and it involves the act of evoking reactions from other individuals. Human communication is marked by intention and anticipation of the reactions and communication in humans can be verbal when mediated by language or non-verbal when no language is involved. Communication can also be direct when a certain pattern of behavior evokes a particular type of response or subtle and indirect when behaviors are not predictable or ambiguous and not even completely comprehensible. Thus communication is separated into certain distinct categories such as:

1. Direct and Indirect communication

2. Verbal and non-verbal communication

Any direct communication can be both verbal and non-verbal just as indirect communication can also be verbal or non verbal. *Verbal communication* can again be direct or indirect and similarly non verbal communication can also be either direct or indirect. So let's say there are four types of communication patterns in humans - verbal and direct, verbal and indirect, non-verbal and direct, non-verbal and indirect. *Examples of verbal* and direct would be saying things that are straightforward or unambiguous and with no hidden or incomprehensible messages. These are verbal expressions of emotions and ideas as they occur. Like when you are happy and say that you are happy, you are using the verbal direct method of communication to express your feelings. *Indirect methods* of verbal communication are using subtle expressions such as taunts, sarcasm, hints etc. that can have ambiguous meanings and do not represent expressions of emotions or ideas 'as they occur'. Thus if you are sad

and do not say so but imply indirectly, then you are using indirect methods to convey your state of mind. *Non verbal communication* is about using cues, facial or bodily expressions, body language, eye or hand movements etc., to express ideas. This can be quite direct like say, hitting a person is rather non verbal but direct as it expresses anger just as crying represents sorrow. However non verbal communication can be indirect such as turning away your eyes from a person you feel uncomfortable with or maintaining prolonged eye contact with a person to convey a message.

Communication is the basis of human and non-human interaction and we can all communicate with a touch or a sound, a look or a symbol, a word or a sentence and also by doing or saying nothing at all. The body is an important interface in communication, the psychology of body in which body language is shown to play an important role in communication. We communicate with our mates through intimate body language and sexual interaction is a very important communication tool in humans and also in animals.

5.2. The psychology of communication will include the different elements or stages of communication in an individual such as:

1. **Absorption** of external information through listening or reading etc;

2. **Interpretation** of the stimuli received;

3. **Reaction** to the information obtained through behavior

The three stages of the communication process as in absorption or taking in information, the interpretation or deriving meaning of the information and reaction or responding to the information are facilitated by the following elements:

1. *Absorption or taking in information* - is through sense organs and we simply absorb the sounds and colors, the spoken words and all external data provided to us. Absorption is an objective process

2. *Interpretation or analysis of information* - involves using brain mechanisms and analyzing external stimuli as well as details such as expressions and subtle verbal and non verbal cues, so interpretation is a subjective process

3. *Reaction or response to the stimuli* - uses physical communication routes such as speech, language or expressions through facial and bodily movements. Reactions are the result of a subjective and an objective process. This is because when presented with certain stimuli we all have a set of predictable responses which are objective but depending on how we interpret the situation subjectively, the reactions might vary to an extent. Reactions can be imitative - you smile when you see someone smiling or it can be just the opposite as when someone tries to look at you and you try to look away.

This reaction or response evoked in an individual can become a stimulus for another chain of responses or the stimulus can be a completely separate event or situation.

Behaviorists will usually consider communication as a stimulus-response pattern with individuals perceiving the stimuli and reacting to them in the form of communication. Freudian psychoanalysis suggests that communication is directly related to how we subjectively perceive the external information based on our own experiences. So 'interpretation' of external stimuli or the mediation of the individual mind is the most important aspect of communication according to psychoanalysis, although behaviorists will completely eliminate the importance of the 'interpretation' part considering communication as nothing but a series of mechanical 'stimulus-response' pattern. Thus according to behavioral psychology, we perceive an object and react to it via communication almost like a computer program. It sounds strange that the importance of mind and consciousness in communication has only been recently acknowledged in 'scientific' psychology.

5.4. ***The methods of communication*** are also equally interesting as humans communicate through the written word and the spoken word and through letters, messages, phone calls, personal face to face conversation, through glances and physical contact, through sex, and on a wider scale through seminars, conferences, news events, newspapers, press releases, books, brochures, and campaigning or propaganda. The newer methods of communication using information technology are via chats and chatrooms, internet and emails, text messages, forums, blogging and networking. Technology has opened up new avenues of communication and the world is now completely dependent on how far and how quickly people are able to communicate.

Communication is central to our modern life, yet it is a difficult and complicated process and a gap remains between the ideas communicated and the ideas perceived. This communication gap as it is generally called is closed only with proper consideration of all verbal, non verbal, indirect and direct elements of the communication process. So in a personal or business meeting the communication process involves not just presentation of the ideas of people verbally but also the non verbal facial and bodily expressions.

The purpose of communication is almost always motivated or intentional as we naturally expect a response from people we communicate with. In fact all communication is based on anticipation of response from others thus communication tend to have a direction or purpose. However the communication gap can create problems in the process and the purpose of communication may remain unfulfilled when communicated ideas are too vague or indirect. The vagueness increases when channels of communication between two or more individuals are remote or distal rather than proximal.

Long distance communication methods such as emails and internet, telephone calls etc. bring in new challenges to the study of communication as we are not able to see the person we communicate with, we find it difficult to 'interpret' the stimuli that we encounter. The ability to 'interpret' the communicative stimuli is a very important part of the communicative process and the interpretation or derivation of the meaning of what we hear or see depends on our inherent need for analysis of all indirect body

language cues, facial expressions and hints or subtle or subconscious processes. Human beings are intelligent and in most cases do not take all information for granted. *The direct face to face communication* provides us with a definite sense of what the other person really means and gives us assurance that our interpretation of the communication is correct. That is why the face to face interviewing process still remains the most popular method of communication in a selection process. All online communication and information on the internet are thus prone to misinterpretation as we are not able to interpret the information using the non verbal cues or expressions that are an essential part of the communication process. The communication gap is thus the gap of interpretation as despite a lot of information there is certain dearth of essential information and our mind recognizes the communication process as incomplete. You may chat with a person online for several hours in a day but unless you are able to see or hear his or her facial and bodily expressions, you can never be assured that the communication process is completely authentic. Of course, modern devices such as the webcam have greatly improved the communication process. Yet it is also true that even if we have all the essential cues of communication, the very fact that we have to interpret the information received subjectively, can suggest the possibility of a communication gap.

The three stages of communication comprise of certain essential elements and a communication gap is inherent in the process of interpretation either because of our own limitations or due to limitations of technology.

5.5. According to experts, a substantial portion of our communication is nonverbal. Every day, we respond to thousands on nonverbal cues and behaviors including postures, facial expression, eye gaze, gestures, and tone of voice. From our handshakes to our hairstyles, nonverbal details reveal who we are and impact how we relate to other people.

Scientific research on nonverbal communication and behavior began with the 1872 publication of Charles Darwin's *The Expression of the Emotions in Man and Animals*. Since that time, there has been an abundance of research on the types, effects and expressions of unspoken communication and behavior. While these signals are often so subtle that we are not consciously aware of them, research has identified several different types of nonverbal communication. In many cases, we communication information in nonverbal ways using groups of behaviors. For example, we might combine a frown with crossed arms and unblinking eye gaze to indicate disapproval.

1. Facial Expression

Facial expressions are responsible for a huge proportion of nonverbal communication. Consider how much information can be conveyed with a smile or a frown. While nonverbal communication and behavior can vary dramatically between cultures, the facial expressions for happiness, sadness, anger and fear are similar throughout the world.

2. Gestures

Deliberate movements and signals are an important way to communicate meaning without words. Common gestures include waving, pointing, and using fingers to indicate number amounts. Other gestures are arbitrary and related to culture.

3. Paralinguistics

Paralinguistics refers to vocal communication that is separate from actual language. This includes factors such as tone of voice, loudness, inflection and pitch. Consider the powerful effect that tone of voice can have on the meaning of a sentence. When said in a strong tone of voice, listeners might interpret approval and enthusiasm. The same words said in a hesitant tone of voice might convey disapproval and a lack of interest.

4. Body Language and Posture

Posture and movement can also convey a great deal on information. Research on body language has grown significantly since the 1970's, but popular media have focused on the over-interpretation of defensive postures, arm-crossing, and leg-crossing, especially after the publication of Julius Fast's book *Body Language*. While these nonverbal behaviors can indicate feelings and attitudes, research suggests that body language is far more subtle and less definitive that previously believed.

5. Proxemics

People often refer to their need for "personal space," which is also an important type of nonverbal communication. The amount of distance we need and the amount of space we perceive as belonging to us is influenced by a number of factors including social norms, situational factors, personality characteristics and level of familiarity. For example, the amount of personal space needed when having a casual conversation with another person usually varies between 18 inches to four feet. On the other hand, the personal distance needed when speaking to a crowd of people is around 10 to 12 feet.

6. Eye Gaze

Looking, staring and blinking can also be important nonverbal behaviors. When people encounter people or things that they like, the rate of blinking increases and pupils dilate. Looking at another person can indicate a range of emotions, including hostility, interest and attraction.

7. Haptics

Communicating through touch is another important nonverbal behavior. There has been a substantial amount of research on the importance of touch in infancy and early childhood. Harry Harlow's classic monkey study demonstrated how the deprivation of touch and contact impedes development. Baby monkeys raised by wire mothers experienced permanent deficits in behavior and social interaction. Touch can be used to communicate affection, familiarity, sympathy and other emotions.

8. Appearance

Our choice of color, clothing, hairstyles and other factors affecting appearance are also considered a means of nonverbal communication. Research on color psychology has demonstrated that different colors can invoke different moods. Appearance can also alter physiological reactions, judgment and interpretations. Just think of all the subtle judgement you quickly make about someone based on his or her appearance. These first impressions are important, which is why experts suggest that job seekers dress appropriately for interviews with potential employers.

5.5. This item presents the classic communication models that are taught in introducing students to interpersonal communication and mass communication, including Shannon's information theory model (the active model), a cybernetic model that includes feedback (the interactive model, an intermediary model (sometimes referred to as a gatekeeper model of the two-step flow), and the transactive model. This model attempts to capture the fundamental interaction of language, medium, and message that enables communication, the socially constructed aspects of each element, and the relationship of creators and consumers of messages both to these elements and each other.

Shannon's (1948) ***model of the communication process*** (Figure 1) provides, in its breakdown of the flow of a message from source to destination, an excellent breakdown of the elements of the communication process that can be very helpful to students who are thinking about how they communicate with others. It remains, however, that these texts generally treat these models as little more than a baseline. They rapidly segue into other subjects that seem more directly relevant to our everyday experience of communication. In interpersonal communication texts these subjects typically include the social construction of the self, perception of self and other, language, nonverbal communication, listening, conflict management, intercultural communication, relational communication, and various communication contexts, including work and family. In mass communication texts these subjects typically include media literacy, media and culture, new media, media industries, media audiences, advertising, public relations, media effects, regulation, and media ethics.

Shannon's Model of the Communication Process

Shannon's (1948) model of the communication process is, in important ways, the beginning of the modern field. Part of its success is due to its structuralist reduction of communication to a set of basic constituents that not only explain how

communication happens, but why communication sometimes fails. Good timing played a role as well. It remains one of the first things most students learn about communication when they take an introductory communication class.

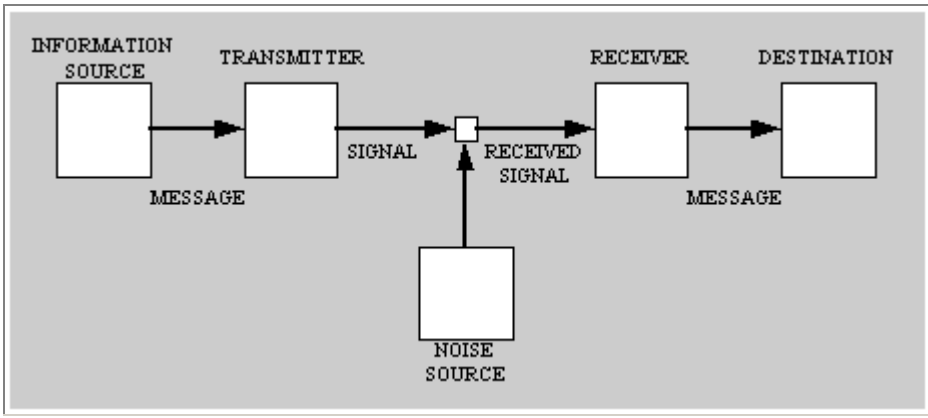


Figure 1: Shannon's (1948) Model of the communication process.

Shannon's model, as shown in Figure 1, breaks the process of communication down into ***eight discrete components***:

1. An information **source**. Presumably a person who creates a message.
2. The **message**, which is both sent by the information source and received by the destination.
3. A **transmitter**. For Shannon's immediate purpose a telephone instrument that captures an audio signal, converts it into an electronic signal, and amplifies it for transmission through the telephone network. Transmission is readily generalized within Shannon's information theory to encompass a wide range of transmitters. The simplest transmission system, that associated with face-to-face communication, has at least two layers of transmission. The first, the mouth (sound) and body (gesture), create and modulate a signal. The second layer, which might also be described as a channel, is built of the air (sound) and light (gesture) that enable the transmission of those signals from one person to another. A television broadcast would obviously include many more layers, with the addition of cameras and microphones, editing and filtering systems, a national signal distribution network (often satellite), and a local radio wave broadcast antenna.
4. The **signal**, which flows through a channel. There may be multiple parallel signals, as is the case in face-to-face interaction where sound and gesture involve different signal systems that depend on different channels and modes of transmission. There may be multiple serial signals, with sound and/or gesture turned into electronic signals, radio waves, or words and pictures in a book.
5. A carrier or **channel**, which is represented by the small unlabeled box in the middle of the model. The most commonly used channels include air, light, electricity, radio waves, paper, and postal systems. Note that there may be multiple channels associated with the multiple layers of transmission, as described above.

6. **Noise**, in the form of secondary signals that obscure or confuse the signal carried. Given Shannon's focus on telephone transmission, carriers, and reception, it should not be surprising that noise is restricted to noise that obscures or obliterates some portion of the signal within the channel. This is a fairly restrictive notion of noise, by current standards, and a somewhat misleading one. Today we have at least some media which are so noise free that compressed signals are constructed with an absolutely minimal amount information and little likelihood of signal loss. In the process, Shannon's solution to noise, redundancy, has been largely replaced by a minimally redundant solution: error detection and correction. Today we use noise more as a metaphor for problems associated with effective listening.
7. A **receiver**. In Shannon's conception, the receiving telephone instrument. In face to face communication a set of ears (sound) and eyes (gesture). In television, several layers of receiver, including an antenna and a television set.
8. A **destination**. Presumably a person who consumes and processes the message.

It remains, however, that Shannon's model is a useful abstraction that identifies the most important components of communication and their general relationship to one another.

Derivative Models of the Communication Process

This model, which is frequently depicted in introductory texts in mass communication, focuses on the important role that intermediaries often play in the communication process. There are, however, many intermediary roles associated with communication. Many of these intermediaries have the ability to decide what messages others see, the context in which they are seen, and when they see them. They often have the ability, moreover, to change messages or to prevent them from reaching an audience (destination). Under the more normal conditions of mass media, in which publications choose some content in preference to other potential content based on an editorial policy, we refer to them as editors (most mass media), moderators (Internet discussion groups), reviewers (peer-reviewed publications), or aggregators (clipping services), among other titles.

Figure 3: An Intermediary Model.

The bidirectionality of communication is commonly addressed in interpersonal communication text with two elaborations of Shannon's model (which is often labeled as the action model of communication): ***the interactive model and the transactive model***. The interactive model, a variant of which is shown in Figure 4, elaborates Shannon's model with the cybernetic concept of feedback often (as is the case in

Figure 4) without changing any other element of Shannon's model. The key concept associated with this elaboration is that destinations provide feedback on the messages they receive such that the information sources can adapt their messages, in real time. This is an important elaboration, and as generally depicted, a radically oversimplified one. Feedback is a message (or a set of messages). The source of feedback is an information source. The consumer of feedback is a destination. Feedback is transmitted, received, and potentially disruptable via noise sources. None of this is visible in the typical depiction of the interactive model. This doesn't diminish the importance of feedback or the usefulness of elaborating Shannon's model to include it. People really do adapt their messages based on the feedback they receive. It is useful, however, to notice that the interactive model depicts feedback at a much higher level of abstraction than it does messages.

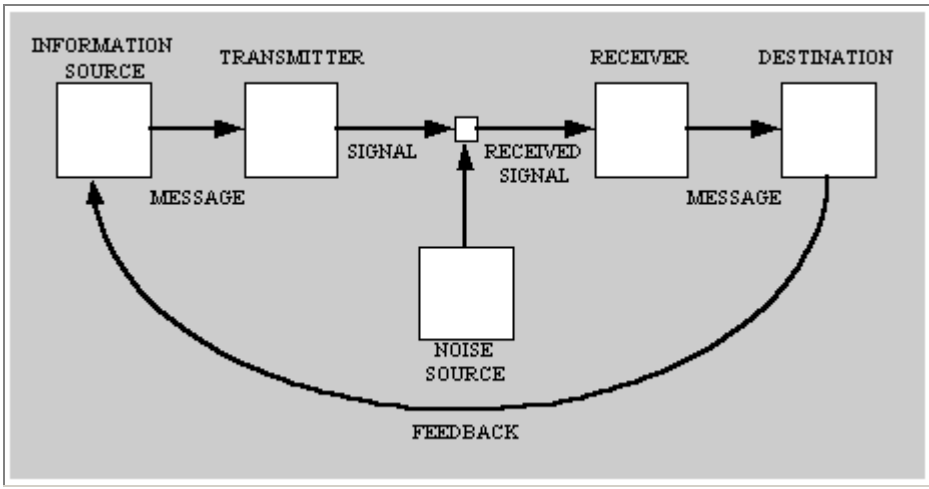


Figure 4: An Interactive Model:

This difference in the level of abstraction is addressed in the transactional model of communication, a variant of which is shown in Figure 5. This model acknowledges neither creators nor consumers of messages, preferring to label the people associated with the model as communicators who both create and consume messages. The model presumes additional symmetries as well, with each participant creating messages that are received by the other communicator. This is, in many ways, an excellent model of the face-to-face interactive process which extends readily to any interactive medium that provides users with symmetrical interfaces for creation and consumption of messages, including notes, letters, C.B. Radio, electronic mail, and the radio.

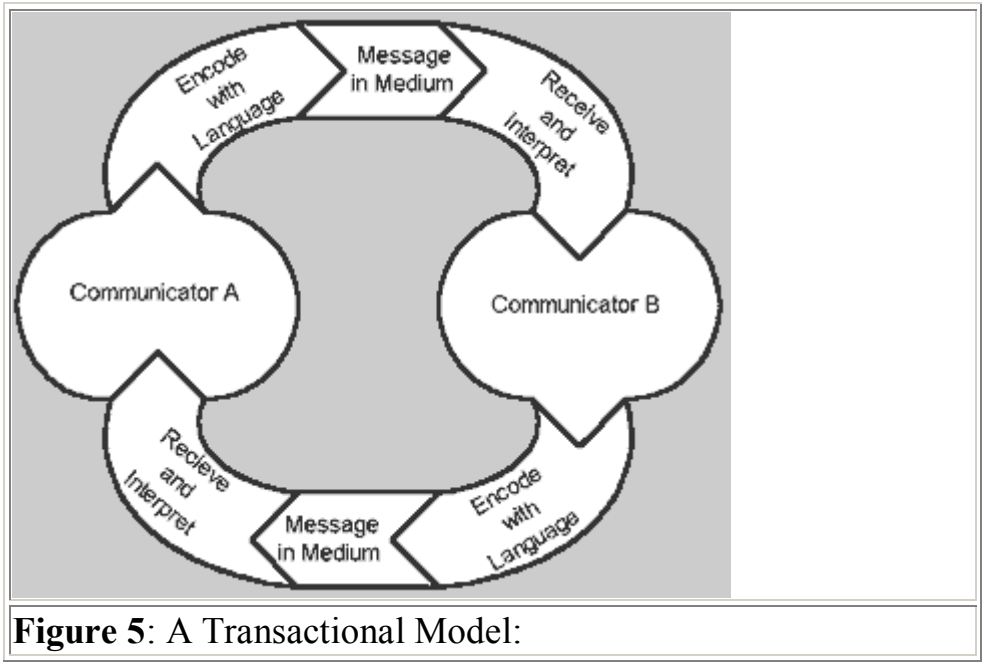


Figure 5: A Transactional Model:

A New Model of the Communication Process

The ecological model of communication asserts that communication occurs in the intersection of four fundamental constructs: communication between people (creators and consumers) is mediated by messages which are created using language within media; consumed from media and interpreted using language: "Who ... says what ... in which channel ... to whom ... with what effect". In the ecological model , the "who" are the creators of messages, the "says what" are the messages, the "in which channel" is elaborated into languages (which are the content of channels) and media (which channels are a component of), the "to whom" are the consumers of messages, and the effects are found in various relationships between the primitives, including relationships, perspectives, attributions, interpretations, and the continuing evolution of languages and media.

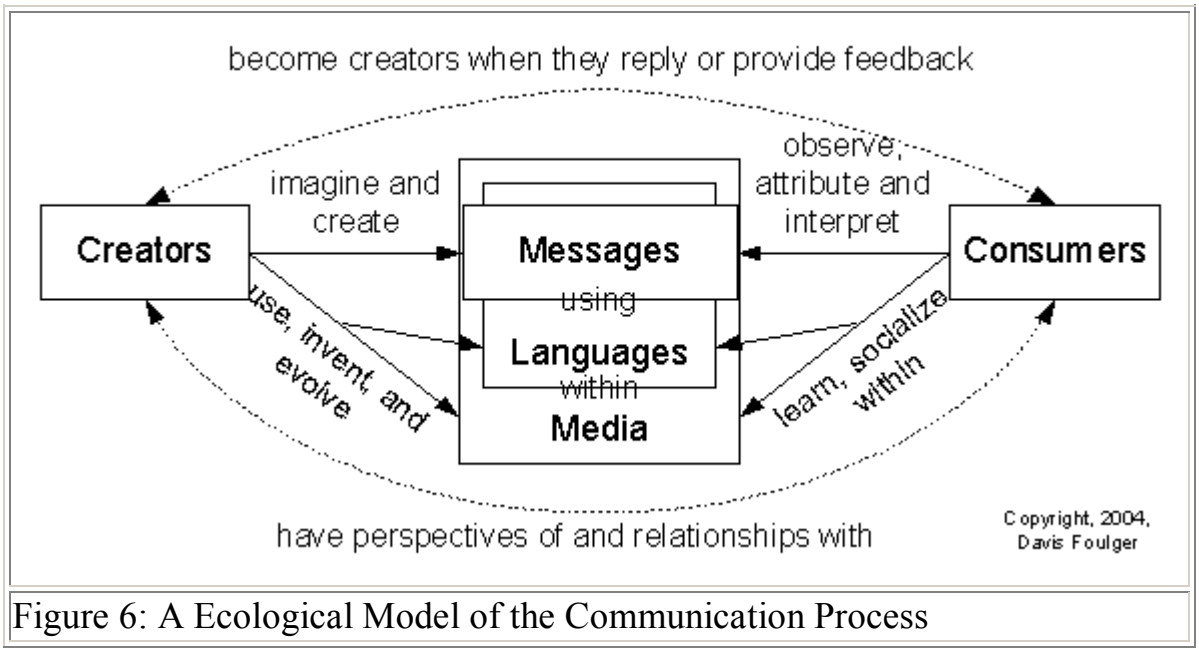


Figure 6: A Ecological Model of the Communication Process

A number of relationships are described in this model:

1. Messages are created and consumed using language;
2. Language occurs within the context of media;
3. People become creators when they reply or supply feedback to other people. Creators become consumers when they make use of feedback to adapt their messages to message consumers. People learn how to create messages through the act of consuming other peoples messages;
4. Creators of messages create messages within the context of their perspectives of and relationships with anticipated consumers of messages. People form these perspectives and relationships as a function of their communication;
5. People learn language by through the experience of encountering language being used within media. The languages they learn will almost always be the languages when communicating with people who already know and use those languages;
6. People invent and evolve languages. While some behavior expressions (a baby's cry) occur naturally and some aspects of language structure may mirror the ways in which the brain structures ideas, language does not occur naturally. People invent new language when there is no language that they can be socialized into. People evolve language when they need to communicate ideas that existing language is not sufficient to.

This ecological model of communication is, in its most fundamental reading, a compact theory of messages and the systems that enable them. Messages are the central feature of the model and the most fundamental product of the interaction of people, language, and media.

Lecture 6

The Psychology of Interpersonal Communication

6.1. Four principles of Interpersonal Communication.

6.2. The notion of Interpersonal Communication and context.

6.3. Interpersonal Communication theories.

Key notions: *interpersonal communication, context, Psychological context, Relational context, Situational context, Environmental context, Cultural context, Uncertainty reduction theory, Social exchange theory, Symbolic interaction, Symbolic interaction, Relational dialectics theory, Coordinated management of meaning, Social penetration theory, Relational patterns of interaction theory, Identity management theory, Attribution theory*

6.1. These principles underlie the workings in real life of interpersonal communication. They are basic to *communication*. We can't ignore them.

Interpersonal communication is inescapable

We can't not communicate. The very attempt not to communicate communicates something. Through not only words, but through tone of voice and through gesture, posture, facial expression, etc., we constantly communicate to those around us. Through these channels, we constantly receive communication from others. Even when you sleep, you communicate. Remember a basic principle of communication in general: people are not mind readers. Another way to put this is: people judge you by your behavior, not your intent.

Interpersonal communication is irreversible

You can't really take back something once it has been said. The effect must inevitably remain. Despite the instructions from a judge to a jury to "disregard that last statement the witness made," the lawyer knows that it can't help but make an impression on the jury. A Russian proverb says, "Once a word goes out of your mouth, you can never swallow it again."

Interpersonal communication is complicated

No form of communication is simple. Because of the number of variables involved, even simple requests are extremely complex. Theorists note that whenever we communicate there are really at least six "people" involved: 1) who you think you are; 2) who you think the other person is; 30 who you think the other person thinks you are; 4) who the other person thinks /she is; 5) who the other person thinks you are; and 6) who the other person thinks you think s/he is.

We don't actually swap ideas, we swap symbols that stand for ideas. This also complicates communication. Words (symbols) do not have inherent meaning; we simply use them in certain ways, and no two people use the same word exactly alike.

Osmo Wiio gives us some communication maxims similar to Murphy's law:

- If communication can fail, it will.
- If a message can be understood in different ways, it will be understood in just that way which does the most harm.
- There is always somebody who knows better than you what you meant by your message.
- The more communication there is, the more difficult it is for communication to succeed.

These tongue-in-cheek maxims are not real principles; they simply humorously remind us of the difficulty of accurate communication.

Interpersonal communication is contextual

In other words, communication does not happen in isolation. There is:

- *Psychological context*, which is who you are and what you bring to the interaction. Your needs, desires, values, personality, etc., all form the psychological context. ("You" here refers to both participants in the interaction.)
- *Relational context*, which concerns your reactions to the other person--the "mix."
- *Situational context* deals with the psycho-social "where" you are communicating. An interaction that takes place in a classroom will be very different from one that takes place in a bar.
- *Environmental context* deals with the physical "where" you are communicating. Furniture, location, noise level, temperature, season, time of day, all are examples of factors in the environmental context.
- *Cultural context* includes all the learned behaviors and rules that affect the interaction. If you come from a culture (foreign or within your own country) where it is considered rude to make long, direct eye contact, you will out of politeness avoid eye contact. If the other person comes from a culture where long, direct eye contact signals trustworthiness, then we have in the cultural context a basis for misunderstanding.

6.2. Interpersonal communication is usually defined by communication scholars in numerous ways, usually describing participants who are dependent upon one another. It can involve one on one conversations or individuals interacting with many people within a society. It helps us understand how and why people behave and communicate in different ways to construct and negotiate a social reality. While interpersonal communication can be defined as its own area of study, it also occurs within other contexts like groups and organizations.Interpersonal communication is the process that we use to communicate our ideas, thoughts, and feelings to another

person. Our interpersonal communication skills are learned behaviors that can be improved through knowledge, practice, feedback, and reflection.

Interpersonal communication includes message sending and message reception between two or more individuals. This can include all aspects of communication such as listening, persuading, asserting, nonverbal communication, and more. A primary concept of interpersonal communication looks at communicative acts when there are few individuals involved unlike areas of communication such as group interaction, where there may be a large number of individuals involved in a communicative act.

Individuals also communicate on different interpersonal levels depending on who they are engaging in communication with. For example, if an individual is communicating with a family member, that communication will more than likely differ from the type of communication used when engaged in a communicative act with a friend or significant other.

Overall, interpersonal communication can be conducted using both direct and indirect mediums of communication such as face-to-face interaction, as well as computer-mediated-communication. Successful interpersonal communication assumes that both the message senders and the message receivers will interpret and understand the messages being sent on a level of understood meanings and implications.

Context refers to the conditions that precede or surround the communication. It consists of present or past events from which the meaning of the message is derived, though it may also, in the case of written communications, depend upon the statements preceding and following the quotation in question. Immediate surroundings may also color the perceived meaning of words; normally safe discourse may easily become contextually ambiguous or offensive in a restroom or shower hall. These influences do not constitute the message by themselves, but rather these extraneous nuances subtly change the message's effective meaning. Ultimately, context includes the entire world, but usually refers to salient factors such as the following:

- *Physical milieu*: the season or weather, current physical location and environment
- *Situational milieu*: classroom, military conflict, supermarket checkout
- *Cultural and linguistic backgrounds*
- *Developmental progress* (maturity) or emotional state
- *Complementary or contrasting roles*: boss and employee; teacher and student; parent, child, and spouse; friend or enemy; partner or competitor

6.3. (1) Uncertainty reduction theory

Uncertainty reduction theory comes from the sociopsycological perspective. It addresses the basic process of how we gain knowledge about other people. According to the theory people have difficulty with uncertainty, they want to be able to predict behavior and therefore they are motivated to seek more information about people.

The theory argues that strangers, upon meeting, go through certain steps and checkpoints in order to reduce uncertainty about each other and form an idea of whether one likes or dislikes the other. As we communicate we are making plans to accomplish our goals. At highly uncertain moments we become more vigilant and rely more on data available in the situation. When we are less certain we lose confidence in our own plans and make contingency plans. The theory also says that higher levels of uncertainty create distance between people and that non-verbal expressiveness tends to help reduce uncertainty.

Constructs include level of uncertainty, nature of the relationship and ways to reduce uncertainty. Underlying assumptions include that an individual will cognitively process the existence of uncertainty and take steps to reduce it. The boundary conditions for this theory are that there must be some kind of outside social situation triggering and internal cognitive process.

According to the theory we reduce uncertainty in ***three ways***:

1.Passive strategies: observing the person.

2.Active strategies: asking others about the person or looking up info.

3.Interactive strategies: asking questions, self-disclosure.

(2) Social exchange theory

Social exchange theory falls under the symbolic interaction perspective. The theory predicts, explains and describes when and why people reveal certain information about themselves to others. Social exchange theory argues the major force in interpersonal relationships is the satisfaction of both people's self interest. Theorists say self interest is not necessarily a bad thing and that it can actually enhance relationships.

According to the theory human interaction is like an economic transaction, in that you may seek to maximize rewards and minimize costs. You will reveal information about yourself when the cost-rewards ratio is acceptable to you. As long as rewards continue to outweigh costs a couple will become increasingly intimate by sharing more and more personal information. The constructs of this theory include discloser, relational expectations, and perceived rewards or costs in the relationship.

The underlying assumptions include that humans weigh out rewards versus costs when developing a relationship. The boundary conditions for this theory are that at least two people must be having some type of interaction.

Social exchange also ties in closely with social penetration theory.

(3)Symbolic interaction

Symbolic interaction comes from the sociocultural perspective in that it relies on the creation of shared meaning through interactions with others. This theory focuses on the ways in which people form meaning and structure in society through interactions. People are motivated to act based on the meanings they assign to people, things, and events.

Symbolic interaction argues the world is made up of social objects that are named and have socially determined meanings. When people interact over time they come to shared meaning for certain terms and actions and thus come to understand events in particular ways. There are three main concepts in this theory: society, self and mind.

Society: Social acts (which create meaning) involve an initial gesture from one individual, a response to that gesture from another and a result.

Self: Self image comes from interaction with others based on others perceptions. A person makes sense of the world and defines their "self" through social interactions. One 's self is a significant object and like all social objects it is defined through social interactions with others.

Mind: Your ability to use significant symbols to respond to yourself makes thinking possible. You define objects in terms of how you might react to them. Objects become what they are through our symbolic minding process.

Constructs for this theory include creation of meaning, social norms, human interactions, and signs and symbols. An underlying assumption for this theory is that meaning and social reality are shaped from interactions with others and that some kind of shared meaning is reached. The boundary conditions for this theory are there must be numerous people communicating and interacting and thus assigning meaning to situations or objects.

(4) Relational dialectics theory

In order to understand relational dialectics theory, we must first understand specifically what encompasses the term *discourse*. Therefore, discourses are "systems of meaning that are uttered whenever we make intelligible utterances aloud with others or in our heads when we hold internal conversations".

This theory also poses the primary assumption that, "Dialogue is simultaneously unity and difference".Therefore, these assumptions insinuate the concept of creating meaning within ourselves and others when we communicate, however, it also shows how the meanings within our conversations may be interpreted, understood, and of course misunderstood. Hence, the creation and interpretations we find in our communicative messages may create strains in our communicative acts that can be termed as 'dialectical tensions.'

So, if we assume the stance that all of our discourse, whether in external conversations or internally within ourselves, has competing properties, then we can take relational dialectics theory and look at what the competing discourses are in our conversations, and then analyze how this may have an effect on various aspects of our lives. Numerous examples of this can be seen in the daily communicative acts we participate in. However, dialectical tensions within our discourses can most likely be seen in interpersonal communication due to the close nature of interpersonal relationships. The well known proverb "opposites attract, but Birds of a feather flock together" exemplifies these dialectical tensions.

The three relational dialectics:

Connectedness and separateness

Most individuals naturally desire to have a close bond in the interpersonal relationships we are a part of. However, it is also assumed that no relationship can be enduring without the individuals involved within it also having their time alone to themselves. Individuals who are only defined by a specific relationship they are a part of can result in the loss of individual identity.

Certainty and uncertainty

Individuals desire a sense of assurance and predictability in the interpersonal relationships they are a part of. However, they also desire having a variety in their interactions that come from having spontaneity and mystery within their relationships as well. Much research has shown that relationships which become bland and monotonous are not desirable.

Openness and closedness

In close interpersonal relationships, individuals may often feel a pressure to reveal personal information. This assumption can be supported if one looks at the postulations within social penetration theory, which is another theory used often within the study of communication. This tension may also spawn a natural desire to keep an amount of personal privacy from other individuals. The struggle in this sense, illustrates the essence of relational dialectics.

(5) Coordinated management of meaning

Coordinated management of meaning is a theory assuming that two individuals engaging in an interaction are each constructing their own interpretation and perception behind what a conversation means. A core assumption within this theory includes the belief that all individuals interact based on rules that are expected to be followed while engaging in communication. "Individuals within any social situation first want to understand what is going on and apply rules to figure things out".

There are ***two different types of rules*** that individuals can apply in any communicative situation:

Constitutive rules – "are essentially rules of meaning used by communicators to interpret or understand an event or message".

Regulative rules – "are essentially rules of action used to determine how to respond or behave".

An example of this can be seen if one thinks of a hypothetical situation in which two individuals are engaging in conversation. If one individual sends a message to the other, the message receiver must then take that interaction and interpret what it means. Oftentimes this can be done on an almost instantaneous level because the interpretation rules applied to the situation are immediate and simple. However, there are also times when one may have to search for an appropriate interpretation of the 'rules' within an interaction. This simply depends on each communicator's previous beliefs and perceptions within a given context and how they can apply these rules to the current communicative interaction. Important to understand within the constructs of this theory is the fact that these 'rules' of meaning "are always chosen within a context". Furthermore, the context of a situation can be understood as a framework for interpreting specific events.

The authors of this theory believe that there are a ***number of different context*** an individual can refer to when interpreting a communicative event:

Relationship context – This context assumes that there are mutual expectations between individuals who are members of a group.

Episode context – This context simply refers to a specific event in which the communicative act is taking place.

Self-concept context – This context involves one's sense of self, or an individual's personal 'definition' of him/herself.

Archetype context – This context is essentially one's image of what his or her belief consists of regarding general truths within communicative exchanges.

(6) Social penetration theory

Oftentimes, when a relationship begins to develop, it is customary for the individuals within the relationship to undergo a process of self-disclosure. Self disclosure is "sharing information with others that they would not normally know or discover. Self-disclosure involves risk and vulnerability on the part of the person sharing the information". The reason that self disclosure is labeled as risky is because oftentimes, individuals undergo a sense of uncertainty and susceptibility in revealing personal information that has the possibility of being judged in a negative way by the receiver. Hence the reason that face-to-face communication must evolve in stages when an initial relationship develops.

There are ***four different stages*** that social penetration theory encompasses.

Orientation stage: Within the orientation stage, individuals exchange very little amounts of information and they are very cautious in their interactions.

Exploratory affective stage: Next, in the exploratory affective stage, individuals become somewhat more friendly and relaxed with their communication styles.

Affective exchange: In the third stage, the affective exchange, there is a high amount of open communication between individuals and typically these relationships consist of close friends or even romantic partners.

Stable stage: The final stage, the stable stage, simply consists of continued expressions of open and personal types of interaction.

Also important to note, is the fact that due to current communicative exchanges involving a high amount of computer mediated contexts in which communication occurs, this area of communication should be addressed in regard to Social Penetration Theory as well. Online communication seems to follow a different set of rules. Because much of online communication between people occurs on an anonymous level, individuals are allowed the freedom of foregoing the interpersonal 'rules' of self disclosure. Rather than slowly disclosing personal thoughts, emotions, and feelings to others, anonymous individuals online are able to disclose personal information immediately and without the consequence of having their identity revealed.

Furthermore, this theory assumes the stance that the decision making process of how much information an individual chooses to self disclose is ultimately rooted in an analysis of the costs and rewards that an individual may acquire when choosing to share personal information.

An example of Social Penetration theory can be seen when one thinks of a hypothetical situation such as meeting someone for the first time. When two individuals meet for the first time, it is the cultural expectation that only impersonal information will be exchanged. This could include information such as names, occupations, age of the conversation participants, as well as various other impersonal information. However, if both members participating in the dialogic exchange decide that they would like to continue or further the relationship; with the continuation of message exchanges, the more personal the information exchanged will become.

(7)Relational patterns of interaction theory

Relational Patterns of Interaction Theory of the cybernetic tradition, studies how relationships are defined by peoples' interaction during communication. Gregory Bateson, Paul Watzlawick, et al. laid the groundwork for this theory and went on to become known as the Palo Alto Group. Their theory became the foundation from which scholars in the field of communication approached the study of relationships.

Ubiquitous communication The Palo Alto Group maintains that a person's presence alone results in them, consciously or not, expressing things about themselves and

their relationships with others (i.e., communicating). A person cannot avoid interacting, and even if they do, their avoidance may be read as a statement by others. This ubiquitous interaction leads to the establishment of "expectations" and "patterns" which are used to determine and explain relationship types.

Expectations Individuals enter communication with others having established expectations for their own behavior as well as the behavior of those they are communicating with. These expectations are either reinforced during the interaction, or new expectations are established which will be used in future interactions. These new expectations are created by new patterns of interaction, established expectations are a result of established patterns of interaction.

Patterns of interaction Established patterns of interaction are created when a trend occurs regarding how two people interact with each other. There are two patterns of particular importance to the theory which form two kinds of relationships. These relationships are, symmetrical relationships and complementary relationships.plpl[]

Symmetrical relationships These relationships are established when the pattern of interaction is defined by two people responding to one and other in the same way. This is a common pattern of interaction within power struggles.

Complementary relationships These relationships are established when the pattern of interaction is defined by two people responding to one and other in opposing ways. An example of such a relationship would be when one person is argumentative while the other is quiet.

Relational control Relational control refers to who, within a relationship, is in control of it. The pattern of behavior between partners over time, not any individual's behavior, defines the control within a relationship. Patterns of behavior involve individuals' responses to others' assertions. There are three kinds of responses: One-down responses are submissive to, or accepting of, another's assertions. One-up responses are in opposition to, or counter, another's assertions. One-across responses are neutral in nature.

Complementary exchanges A complementary exchange occurs when a partner asserts a one-up message which the other partner responds to with a one-down response. When complementary exchanges are frequently occurring within a relationship, and the parties at each end of the exchange tend to remain uniform, it is a good indication of a complementary relationship existing.

Symmetrical exchanges Symmetrical exchanges occur when one partner's assertion is countered with a reflective response. So, when a one-up assertion is met with a one-up response, or when a one-down assertions is met with a one-down response, a symmetrical exchange occurs. When symmetrical exchanges are frequently occurring within a relationship, it is a good indication of a symmetrical relationship existing.

(8) Identity management theory

Falling under the Socio-Cultural tradition and developed by Tadasu Todd Imahori and William R. Cupach, identity-management theory explains the establishment, development, and maintenance of identities within relationships, as well as changes which occur to identities due to relationships.

Establishing identities People establish their identities (or faces), and their partners, through a process referred to as "facework".Everyone has a desired identity which they're constantly working towards establishing. This desired identity can be both threatened and supported by attempting to negotiate a relational identity (the identity one shares with their partner). So, our desired identity is directly influenced by our relationships, and our relational identity by our desired individual identity.

Cultural influence Identity-management pays significant attention to intercultural relationships and how they affect the relational and individual identities of those involved. How partners of different cultures negotiate with each other, in an effort to satisfy desires for adequate autonomous identities and relational identities, is important to identity-management theory. People take different approaches to coping with this problem of cultural influence.

Tensions within intercultural relationships Identity freezing occurs when one partner feels like they're being stereotyped and not recognized as a complex individual. This tends to occur early on in relationships, prior to partners becoming well acquainted with each other, and threatens individuals' identities. Showing support for oneself, indicating positive aspects of one's cultural identity, and having a good sense of humor are examples of coping mechanisms used by people who feel their identities are being frozen. It is also not uncommon for people in such positions to react negatively, and cope by stereotyping their partner, or totally avoiding the tension.

When tension is due to a partner feeling that their cultural identity is being ignored it is referred to as a nonsupport problem. This is a threat to one's face, and individuals often cope with it in the same ways people cope with identity freezing.

Self-other face dialectic occurs when one partner wants to, but has trouble with, supporting their partner's cultural identity while also asserting their own. They cope with this by standing their ground, giving in, alternating in their support of each identity, and also by avoiding the issue completely.

(9) Attribution theory

Attribution Theory is part of the Sociopsychological Tradition and explains how individuals go through a process that makes inferences about observed behavior. Attribution theory assumes that we make attributions, or social judgments, as a way to clarify or predict behavior. Attribution theory assumes that we are sense-making creatures and that we draw conclusions of the actions that we observe.

Steps to the attribution process

1 The first step of the attribution process is to observe the behavior or action.

2 The second step is to make judgments of interactions and the intention of that particular action.

3 The last step of the attribution process is making the attribution which will be either internal, where the cause is related the person, or external, where the cause of the action is circumstantial.

An example of this process is when a student fails a test, an observer may choose to attribute their behavior to internal causes, such as they did not study because they are lazy or have poor work ethic. They might also attribute their behavior to external factors such as the test was too difficult or they had a lot of other stressful things going on in their life that caused them to be distracted. We also make attributions of our own behavior. Using this same example if it were you who received a failing test score you might make an internal attribution, such as "I just don't understand this material" or you could make an external attribution, such as this test was just too difficult.

Expectancy violations theory

Expectancy violations theory is part of the sociopsychological tradition, and explains the relationship between non-verbal message production and the interpretations people hold for those non-verbal behaviors. Individuals hold certain expectations for non-verbal behavior that is based on the social norms, past experience and situational aspects of that behavior. When expectations are either met or violated, we make assumptions of the behavior and judge them to be positive or negative.

Arousal

When a deviation of expectations occurs there is an increased interest in the situation, also known as arousal. There are two types of arousal: Cognitive arousal- our mental awareness of expectancy deviations Physical arousal- challenges our body faces as a result of expectancy deviations.

Reward valence

When an expectation is not met, we hold particular perceptions as to whether or not that violation is considered rewarding. How an individual evaluates the interaction will determine how they view the positive or negative impact of the violation.

Lecture 7

Cognitive psychology: Detecting and Perceiving the World. Sensation and Perception

7.1. Sensation and Perception. Psychophysics.

7.2. Perception and the Perceptual Process.

7.3. Gestalt Laws of Perceptual Organization.

7.4. The Psychology of Attention.

7.5. Perception: illusions.

Key notions: *cognitive psychology, Perception, Language, Attention, Memory, Problem-Solving, Decision-Making and Judgment, Intelligence, sensation, Psychophysics, perceptual processes steps, Gestalt psychology, phiphenomenon, illusion*

7.1. Major Topics in Cognitive Psychology:

- Perception
- Language
- Attention
- Memory
- Problem-Solving
- Decision-Making and Judgment
- Intelligence

***Important People in the History of Cognitive Psychology*:**

- Gustav Fechner
- Wilhelm Wundt
- Edward B. Titchener
- Hermann Ebbinghaus
- William James
- Wolfgang Kohler
- Edward Tolman
- Jean Piaget
- Noam Chomsky
- David Rumelhart
- James McClelland

In psychology, **sensation** and **perception** are stages of processing of the senses in human and animal systems, such as vision, auditory, vestibular, and pain senses. Sensation is the function of the low-level biochemical and neurological events that begin with the impinging of a stimulus upon the receptor cells of a sensory organ. Perception is the mental process or state that is reflected in statements like "I see a uniformly blue wall", representing awareness or understanding of the real-world cause of the sensory input.

In other words, sensations are the first stages in the functioning of senses to represent stimuli from the environment, and perception is a higher brain function about interpreting events and objects in the world.However, as you will soon see, they are very distinct, yet complementary processes. In this section, we will discuss some concepts central to the study of sensation and perception and then move on to discuss vision and the perception of pain (it is not possible in the scope of these notes to discuss all the senses).

Sensations can be defined as ***the passive process of bringing information from the outside world into the body and to the brain.*** The process is passive in the sense that we do not have to be consciously engaging in a "sensing" process. Perception can be defined as ***the active process of selecting, organizing, and interpreting the information brought to the brain by the senses.***

A) HOW THEY WORK TOGETHER:

1) Sensation occurs:

a) sensory organs absorb energy from a physical stimulus in the environment.

b) sensory receptors convert this energy into neural impulses and send them to the brain.

2) Perception follows:

a) the brain organizes the information and translates it into something meaningful.

B) But what does "meaningful" mean? How do we know what information is important and should be focused on?

1) Selective Attention - process of discriminating between what is important & is irrelevant (Seems redundant: selective-attention?), and is influenced by motivation.

For example - students in class should focus on what the teachers are saying and the overheads being presented. Students walking by the classroom may focus on people in the room, who is the teacher, etc., and not the same thing the students in the class.

2) Perceptual Expectancy - how we perceive the world is a function of our past experiences, culture, and biological makeup.For example, as an American, when I look at a highway, I expect to see cars, trucks, etc, NOT airplanes. But someone from

a different country with different experiences and history may not have any idea what to expect and thus be surprised when they see cars go driving by.

Another example - you may look at a painting and not really understand the message the artist is trying to convey. But, if someone tells you about it, you might begin to see things in the painting that you were unable to see before.

ALL OF THIS IS CALLED Psychophysics

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

In order to measure these events, psychologists use THRESHOLDS.

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

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

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

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

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

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

a) Noise - how much outside interference exists.

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

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

7.2. The perceptual process allows us to experience the world around us. Take a moment to think of all the things you perceive on a daily basis. At any given moment, you might see familiar objects in your environment, feel the touch of objects and people against your skin, smell the aroma of a home-cooked meal and hear the sound of music playing in your next door neighbor's apartment. All of these things help make up our conscious experience and allow us to interact with the people and objects around us.

In this overview of perception and the perceptual process, we will learn more about how we go from detecting stimuli in the environment to actually taking action based on that information.

Perception is our sensory experience of the world around us and involves both the recognition of environmental stimuli and actions in response to these stimuli. Through the perceptual process, we gain information about properties and elements of the environment that are critical to our survival. Perception not only creates our experience of the world around us; it allows us to act within our environment.

Perception includes the five senses; touch, sight, taste smell and taste. It also includes what is known as proprioception, a set of senses involving the ability to detect changes in body positions and movements. It also involves the cognitive processes required to process information, such as recognizing the face of a friend or detecting a familiar scent.
The perceptual process is a sequence of steps that begins with the environment and leads to our perception of a stimulus and an action in response to the stimulus. This process is continual, but you do not spend a great deal of time thinking about the actual *process* that occurs when you perceive the many stimuli that surround you at any given moment.

The process of transforming the light that falls on your retinas into an actual visual image happens unconsciously and automatically. The subtle changes in pressure against your skin that allow you to feel object occur without a single thought.

In order to fully understand how the perception process works, we'll start by breaking down each step.

The Steps in the Perceptual Process

1. *The Environmental Stimulus*
2. *The Attended Stimulus*
3. *The Image on the Retina*
4. *Transduction*
5. *Neural Processing*
6. *Perception*
7. *Recognition*
8. *Action*

The world is full of stimuli that can attract our attention through various senses. The **environmental stimulus** is everything in our environment that has the potential to be perceived. This might include anything that can be seen, touched, tasted, smelled or heard. It might also involve the sense of proprioception, such as the movements of the arms and legs or the change in position of the body in relation to objects in the environment.

For example, imagine that you are out on a morning jog at your local park. As you perform your workout, there are a wide variety of environmental stimuli that might capture your attention. The tree branches are swaying in the slight breeze; a man is out on the grass playing fetch with his Golden Retriever; a car drives past with the windows rolled down and the music blaring; a duck splashes in a nearby pond. All of these things represent the environmental stimuli, serving as a starting point for the perceptual process.

The **attended stimulus** is the specific object in the environment on which our attention is focused. In many cases, we might focus on stimuli that are familiar to us, such as the face of a friend in a crowd of strangers at the local coffee shop. In other instances, we are likely to attend to stimuli that have some degree of novelty.

From our earlier example, let's imagine that during your morning job you focus your attention on the duck floating in the nearby pond. The duck represents the attended stimulus. During the next step of the perceptual process, the visual process will progress.

Next, the attended stimulus is formed as an image on the retina. The first part of this process involves the light actually passing through the cornea and pupil and onto the lens of the eye. The cornea helps focus the light as it enters the eye, and the iris of the eye controls the size of the pupils in order to determine how much light to let in. The cornea and lens act together to project an inverted image on the retina.

As you might already be aware, the image on the retina is actually upside down from the actual image in the environment. At this stage of the perceptual process, this is not terribly important. The image has still not been perceived, and this visual information will be changed even more dramatically in the next step of the process.

The image on the retina is then transformed into electrical signals in a process known as **transduction**. This allows the visual messages to be transmitted to the brain to be interpreted.

The electrical signals then undergo **neural processing**. The path followed by a particular signal depends on what type of signal it is (i.e. an auditory signal or a visual signal).

Through the series of interconnect neurons located throughout the body, electrical signals are propagated from the receptors cells to the brain. In our previous example, the image of duck floating in the pond is received as light on the retina, which is then transduced into an electrical signal and then processed through the neurons in the visual network.

In the next step of the perceptual process, you will actually perceive the stimuli and become aware of its presence in the environment.
In the next step of the perception process, we actually perceive the stimulus object in the environment. It is at this point that we become consciously aware of the stimulus.

Let's consider our previous example, in which we imagined that you were out for a morning jog in the park. At the perception stage, you have become aware of that there is something out on the pond to perceive.

Now, it is one thing to be *aware* of stimuli in the environment, and quite another to actually become fully consciously aware of what we have perceived. In the next stage of the perceptual process, we will sort the perceived information into meaningful categories.
Perception doesn't just involve becoming consciously aware of the stimuli. It is also necessary for our brain to categorize and interpret what it is we are sensing. Our ability to interpret and give meaning to the object is the next step, known as **recognition**.

Continuing our example, it is at the recognition stage of the perceptual process that you realize that there is a duck floating on the water. The recognition stage is an essential part of perception since it allows us to make sense of the world around us. By placing objects in meaningful categories, we are able to understand and react to the world around us.
The final step of the perceptual process involves some sort of **action** in response to the environmental stimulus. This could involve a variety of actions, such as turning your head for a closer look or turning away to look at something else.

The action phase of perceptual development involves some type of motor action that occurs in response to the perceived and recognized stimulus. This might involve a major action, like running toward a person in distress, or something as subtle as blinking your eyes in response to a puff of dust blowing through the air.

7.3. ***Gestalt psychology*** was founded by German thinkers Max Wertheimer, Wolfgang Kohler and Kurt Koffka and focused on how people interpret the world. The Gestalt perspective formed partially as a response to the structuralism of Wilhelm Wundt, who focused on breaking down mental events and experiences to the smallest elements. Max Wertheimer noted that rapid sequences of perceptual events, such as rows of flashing lights, create the illusion of motion even when there is none. This is known as the ***phi phenomenon.*** Motion pictures are based upon this principle, with a series of still images appearing in rapid succession to form a seamless visual experience.

According to Gestalt psychology, the whole is different than the sum of its parts. Based upon this belief, Gestalt psychologists developed a set of principles to explain perceptual organization, or how smaller objects are grouped to form larger ones. These principles are often referred to as the "laws of perceptual organization."

However, it is important to note that while Gestalt psychologists call these phenomena "laws," a more accurate term would be "principles of perceptual organization."

Law of Similarity

Law of Similarity:

Items that are similar tend to be grouped together.

In the image above, most people see vertical columns of circles and squares.

The law of similarity suggests that things similar things tend to appear grouped together. Grouping can occur in both visual and auditory stimuli.

Law of Pragnanz

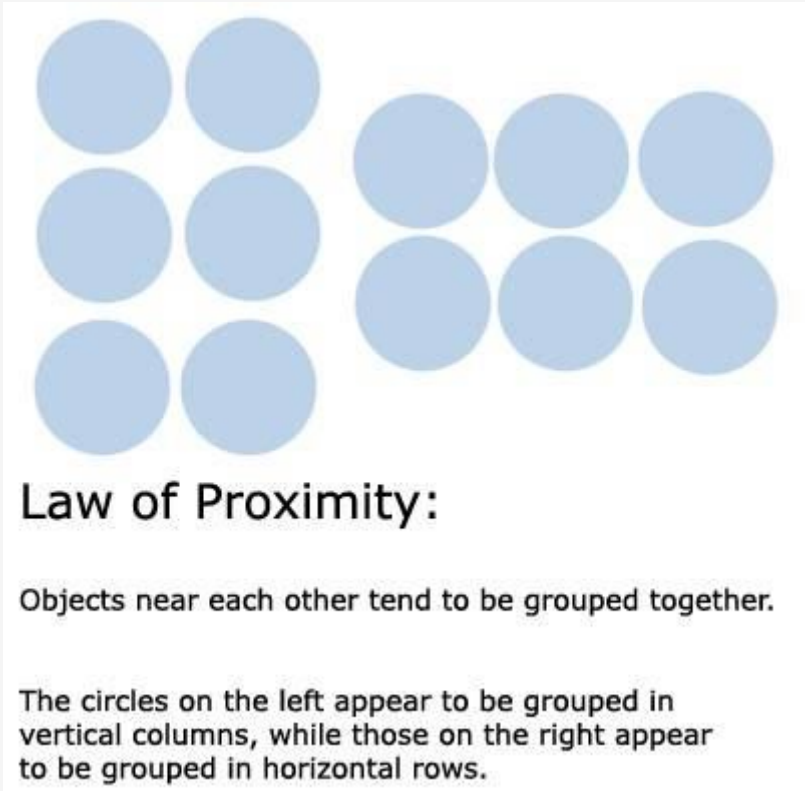
Law of Pragnanz:

Reality is organized or reduced to the simplest form possible.

For example, we see the image above as a series of circles rather than as many much more complicated shapes.

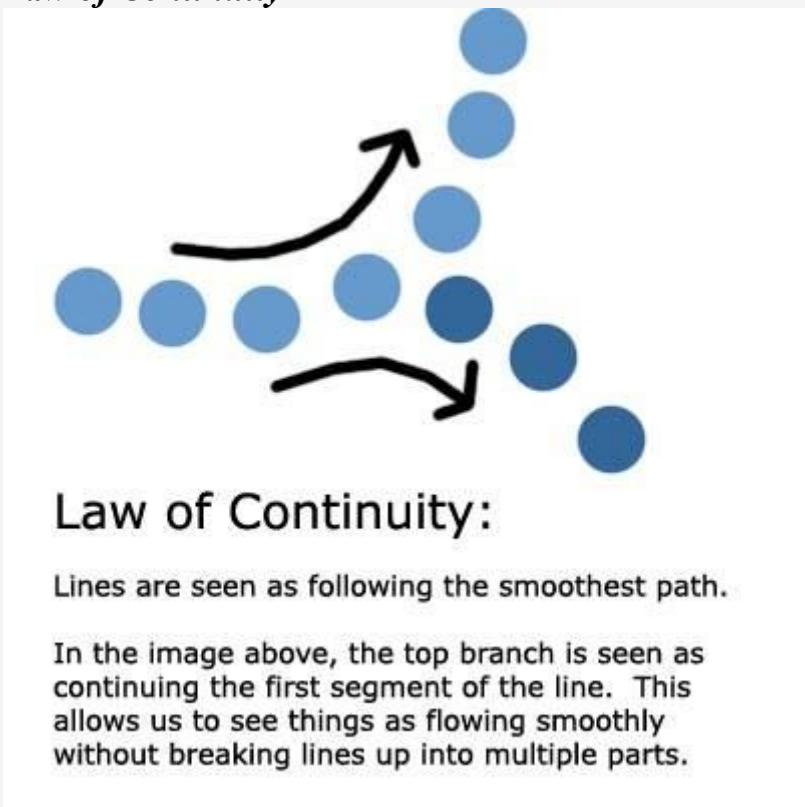
The word *pragnanz* is a German term meaning "good figure." The law of Pragnanz is sometimes referred to as the law of good figure or the law of simplicity. This law holds that objects in the environment are seen in a way that makes them appear as simple as possible.

Law of Proximity



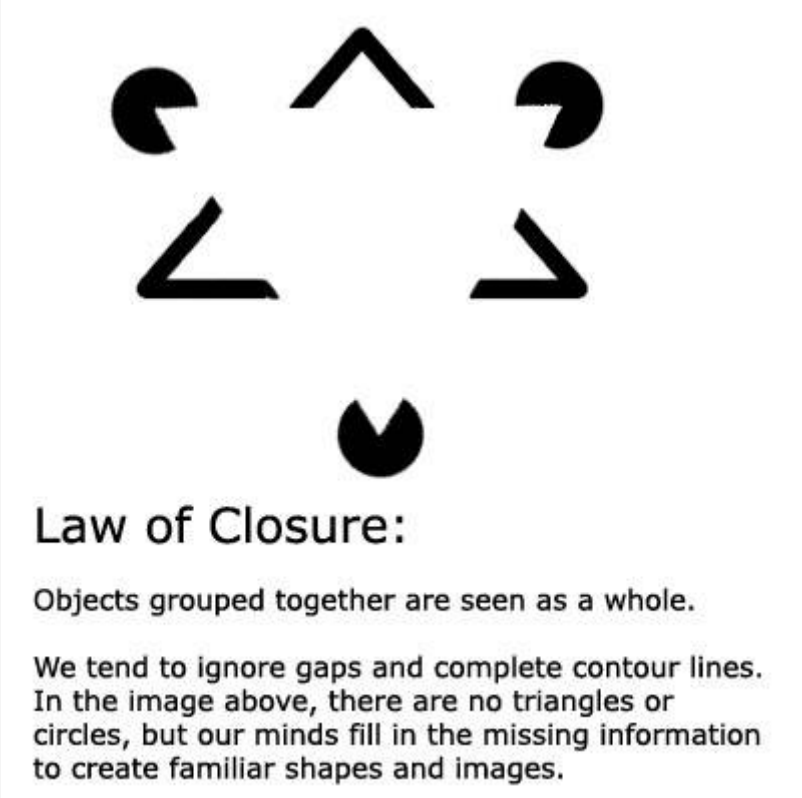
According to the law of proximity, things that are near each other seem to be grouped together.

Law of Continuity



The law of continuity holds that points that are connected by straight or curving lines are seen in a way that follows the smoothest path. Rather than seeing separate lines and angles, lines are seen as belonging together.

Law of Closure



According to the law of closure, things are grouped together if they seem to complete some entity. Our brains often ignore contradictory information and fill in gaps in information.

7.4. Attention is a concept studied in cognitive psychology that refers to how we actively process specific information present in our environment. As you are reading this, there are numerous sights, sounds and sensations going on around you – the pressure of your feet against the floor, the sight of the street out of a nearby window, the soft warmth of your shirt, the memory of a conversation you had earlier with a friend. How do we manage to experience all of these sensations and still focus on just one element of our environment?

According to psychologist and philosopher William James, attention "is the taking possession of the mind, in clear and vivid form, of one out of what may seem several simultaneously possible objects or trains of thoughts…It implies withdrawal from some things in order to deal effectively with others."

Think of attention as a highlighter. As you read through a section of text in a book, the highlighted section stands out, causing you to focus your interest on that area. Attention allows you to "tune out" information, sensations and perceptions that are not relevant at the moment and instead focus your energy on the information that is important.

Attention is the cognitive process of paying attention to one aspect of the environment while ignoring others. In 1890, William James, in his textbook *Principles of Psychology*, remarked:

> " *Everyone knows what attention is. It is the taking possession by the mind, in clear and vivid form, of one out of what seem several simultaneously possible objects or trains of thought. Focalization, concentration, of consciousness are of its essence. It implies withdrawal from some things in order to deal effectively with others, and is a condition which has a real opposite in the confused, dazed, scatterbrained state which in French is called distraction, and Zerstreutheit in German.* "

Attention remains a major area of investigation within education, psychology and neuroscience.

Overt and covert attention

Attention may be differentiated according to its status as "overt" versus "covert". *Overt attention* is the act of directing sense organs towards a stimulus source. *Covert attention* is the act of mentally focusing on one of several possible sensory stimuli. Covert attention is thought to be a neural process that enhances the signal from a particular part of the sensory panorama. (e.g. While reading, shifting overt attention would amount to movement of eyes to read different words, but covert attention shift would occur when you shift your focus from semantic processing of word to the font or color of the word you are reading.)

What is Attention?

- ability to focus on a task
- ability to concentrate
- refers to the allocation of processing resources (Anderson, 1995) (assumes limited resources)

Different Aspects of Attention

- selective attention
- divided attention
- automaticity

Selective Attention

- difficult to attend to more that thing at the same time
- trying to attend to one task over another requires selective attention

Theoretical Interpretations of Selective Attention

Bottleneck theories or filter theories (Broadbent, 1958)

bottleneck is a mechanism that limits the amount of information to be attended to

what gets through? what is selected and when?

early selection

Broadbent (1958) proposed that physical characteristics of messages are used to select one message for further processing and all others are lost

attenuation

Treisman (1964) proposed that physical characteristics are used to select one message for full processing and other messages are given partial processing

late selection

Deutsch & Deutsch (1963) proposed that all messages get through, but that only one response can be made (late selection)

Treisman & Geffen (1967) tests between attenuation and late selection -- guess who wins?!

dichotic listening + detect target words in either channel (tap upon detection)

detection much worse in unattended channel, supporting attenuation...if late selection, detection should be no problem since all info is getting through

<u>Divided Attention and Dual Task Performance</u>

difficult to attend to more that thing at the same time

trying to attend to two stimuli at once and making multiple responses rather than making one response to multiple stimuli (interference)

<u>Theoretical Interpretations of Divided Attention</u>

Capacity Theories

- limited amount of resources available to conduct tasks (Kahneman, 1973)
- multiple resources, only one cognitive process can occur at a time (Pashler)

<u>Automaticity</u>

automatic processing:

- does not require attention
- driving a car & listening to the radio

- reading (as in the Stroop task)

controlled processing:

- requires attention

Feature Integration Theory (Treisman & Gelade, 1980, Treisman, 1992. 1993)

theory of attention and perceptual processing

a) sometimes process all parts of a scene in parallel (at the same time)

b) sometimes process parts of the scene serially (one at a time)

respectively, testing two types of processing:

a) processing that involves divided attention (automatic registration of features in parallel)

b) processing that requires focused attention (a more demanding kind of processing that is required when objects are more complex)

respectively, using two types of stimulus situations to test two different types of processing:

Treisman and Gelade (1980) hypothesized that if isolated features involved divided attention and targets could be identified in parallel with fillers, and combination features involved focused attention and targets could be identified serially with the fillers. Theoretically, provides support for feature integration theory -- people must focus attention on a stimulus before they can synthesize its features into a pattern:

> practically, this is not just visual...auditory too...*you must focus your attention on complex incoming information in order synthesize it into a meaningful pattern*

7.5. ***An illusion*** is a distortion of a sensory perception. Each of the human senses can be deceived by illusions, but visual illusions are the most well known. Some illusions are subjective; different people may experience an illusion differently, or not at all.

- *Optical illusions*, such the use of Mueller Lyer illusion, exploit assumptions made by the human visual system.
- *Auditory illusions*, such as the Shepard Tone, exploit our hearing.
- *Touch illusions* exploit the human sense of touch.
- *Autokinet*ic illusion

An ***optical illusion*** is characterized by visually perceived images that, at least in common sense terms, are deceptive or misleading. Therefore, the information

gathered by the eye is processed by the brain to give, on the face of it, a percept that does not tally with a physical measurement of the stimulus source. A conventional assumption is that there are physiological illusions that occur naturally and cognitive illusions that can be demonstrated by specific visual tricks that say something more basic about how human perceptual systems work.

An ***auditory illusion*** is an illusion of hearing, the sound equivalent of an optical illusion: the listener hears either sounds which are not present in the stimulus, or "impossible" sounds. In short, audio illusions highlight areas where the human ear and brain, as organic, makeshift tools, differ from perfect audio receptors (for better or for worse).

Touch illusions are illusions that exploit the sense of touch.

Examples

An example of a touch illusion is the contingent after-effect. When the thumb and forefinger are slid repeatedly along the edge of a wedge, a rectangular block then handled in the same manner will feel deformed.

Moving with index and middle finger crossed along an edge feels like two parallel edges.

If a person wears a baseball cap for a long period of time and then takes it off, it may still be felt.

Another is a physiological illusion where with one hand immersed in cold water and the other in hot and then both in lukewarm, the lukewarm water will feel both hot and cold.

An autokinetic illusion autokinetic **effect** is a phenomenon of human visual perception in which a stationary, small point of light in an otherwise dark or featureless environment appears to move. It was first recorded by a Russian officer keeping watch who observed illusory movement of a star near the horizon. It presumably occurs because motion perception is always relative to some reference point. In darkness or in a featureless environment there is no reference point, so the movement of the single point is undefined. The direction of the movements does not appear to be correlated with the involuntary eye movements, but may be determined by errors between eye position and that specified by efference copy of the movement signals sent to the extraocular muscles.

Lecture 8

Cognitive psychology: Memory

8.1. Memory. The Stage Model of Memory. The organization of memory.

8.2. Basic Memory Processes.

8.3. The Atkinson & Shiffrin Information Processing Model. Theories of Forgetting.

8.4. The PQ4R method.

Key notions: *memory, sensory memory, short-term memory (STM), long-term memory (LTM), clustering, encoding, storage, retrieval, the Atkinson and Shiffrin Information Processing Model, Theories of Forgetting, the PQ4R method*

8.1. Have you ever wondered how you manage to remember information for a test? The ability to create new memories, store them for periods of time and recall them when they are needed allows us to learn and interact with the world around us. The study of human memory has been a subject of science and philosophy for thousands of years and has become one of the major topics of interest within cognitive psychology. But what exactly is memory? How are memories formed?

Memory refers to the processes that are used to acquire, store, retain and later retrieve information. There are three major processes involved in memory: encoding, storage and retrieval.In order to form new memories, information must be changed into a usable form, which occurs through the process known as *encoding*. Once information has been successfully encoded, it must be stored in memory for later use. Much of this stored memory lies outside of our awareness most of the time, except when we actually need to use it. It is a fundamental component of daily life. We rely on it so heavily, that it is not a stretch to say that life without memory would be close to impossible. Our very survival depends on our ability to remember who we are, who others are, our past experiences, what is dangerous, what is safe, etc. Its importance can't be understated.

While several different models of memory have been proposed, ***the stage model*** of memory is often ***used to explain the basic structure and function of memory***. Initially proposed in 1968 by Atkinson and Shiffrin, this theory outlines *three* separate stages of memory: *sensory memory, short-term memory and long-term memory.*

- ***Sensory Memory***

  Sensory memory is the earliest stage of memory. During this stage, sensory information from the environment is stored for a very brief period of time, generally for no longer than a half-second for visual information and 3 or 4

seconds for auditory information. We attend to only certain aspects of this sensory memory, allowing some of this information to pass into the next stage - short-term memory.

- ***Short-Term Memory***

  Short-term memory, also known as active memory, is the information we are currently aware of or thinking about. In Freudian psychology, this memory would be referred to as the conscious mind. Paying attention to sensory memories generates the information in short-term memory. Most of the information stored in active memory will be kept for approximately 20 to 30 seconds. While many of our short-term memories are quickly forgotten, attending to this information allows it to continue on the next stage - long-term memory.

- ***Long-Term Memory***

Long-term memory refers to the continuing storage of information. In Freudian psychology, long-term memory would be call the preconscious and unconscious. This information is largely outside of our awareness, but can be called into working memory to be used when needed. Some of this information is fairly easy to recall, while other memories are much more difficult to access.

The ability to access and retrieve information from long-term memory allows us to actually use these memories to make decisions, interact with others and solve problems. But how is information organized in memory? The specific way information is organized in long-term memory is not well understood, but researchers do know that these memories are arranged in groups.

Clustering is used to organize related information into groups. Information that is categorized becomes easier to remember and recall. For example, consider the following group of words:

Desk, apple, bookshelf, red, plum, table, green, pineapple, purple, chair, peach, yellow

Spend a few seconds reading them, then look away and try to recall and list these words. How did you group the words when you listed them? Most people will list using three different categories: *color, furniture and fruit.*

One way of thinking about memory organization is known as the **semantic network model**. This model suggests that certain triggers activate associated memories. A memory of a specific place might activate memories about related things that have occurred in that location. For example, thinking about a particular campus building might trigger memories of attending classes, studying and socializing with peers.

8.2. Memory can be defined as ***the storage of learned information for retrieval and future use*.**

I. The Key Questions

When psychologists study memory they usually focus on 3 key questions:

1) How does information get **INTO** memory?

2) How is information **MAINTAINED** in memory?

3) How do we get information **BACK OUT** of memory?

These 3 questions correspond to the 3 key processes in memory:

ENCODING --> STORAGE --> RETRIEVAL

A. Encoding - ***process of forming a memory code in order to get information into memory.***

For Example: we may emphasize the shape of a dog's nose to identify the breed (e.g., a German Sheppard has a longer, more pointed nose than a bull dog) and subsequently make a code for "German Sheppard" according to the dog's nose.

1) Encoding usually involves **attention** - ***focusing awareness on a narrow range of stimuli or events.***

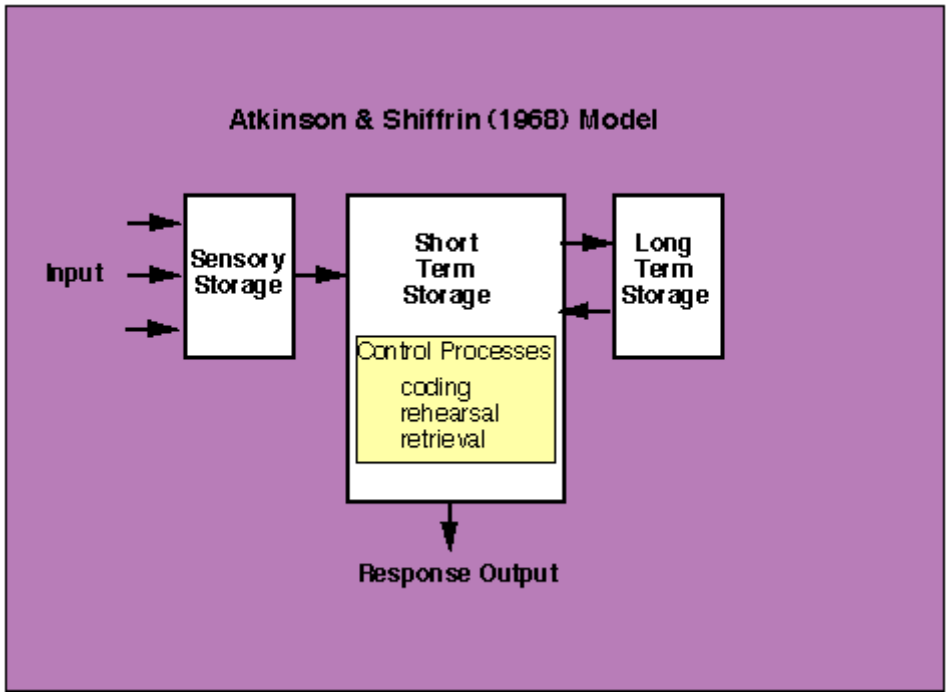
B. Storage (memory stores) - ***maintaining encoded information in memory over a period of time.***

C. Retrieval - ***recovering information from memory stores.***

These 3 processes are the foundation for all memory - how it works and why it may not work at times. When memory does not work, we have forgetting, which may occur at any of these 3 levels.

The most popular model/theoretical framework today is the Information Processing Theory, modeled after computers.

8.3. According to ***the Atkinson and Shiffrin Information Processing Model,*** information must pass through *three* temporary storage buffers (stores) before it can be placed into more permanent storage, and then retrieved for later use.



For the memory process to begin, we must first encounter some stimulus (identified as "input" in the model above), which goes into sensory storage.

A. Sensory Storage - ***the immediate, initial recording of sensory information.***

Here information is preserved for a very brief time (usually only a fraction of a second) in its original form.

The name "sensory storage" implies that something perceptual occurs. In fact, what enters into sensory storage are images (in the case of vision), or more precisely, afterimages. Although the actual stimulus may have disappeared, we may still perceive it for a second or so.

The actual length of time an image exists in sensory storage depends on the modality:

1) Iconic memory - a visual image in sensory storage. Although most people seem to believe that visual images last longer (this is based on intuition, not science), they do not - they last approximately 1/4 of a second.

2) Echoic memory - auditory image. These (as well as other senses) seem to last up to 3 seconds.

SO, we can see that within sensory storage we have 2 distinct stores - an iconic and echoic.

Once one of these types of memories occur, we have some raw data that will be lost if we do not engage in one of two processes (these two processes are required to get information from sensory memory to short term memory).

1) Pattern recognition - when new information comes into sensory storage, we actively search through long term memory in an effort to find a match for this new raw data.

2) Attention - this is pretty obvious. The more we pay attention to a stimulus, the more likely it will continue onto the next memory store (short term memory)

Once we have successfully recognized or attended to the information, we are able to bring the information into SHORT-TERM MEMORY (STM).

B. Short-Term Memory - *a limited capacity store that can maintain information for approximately 20 seconds*.

It is possible to extend duration of STM (to approximately 30 seconds) by engaging in a process called Maintenance Rehearsal.

1) Maintenance Rehearsal - *the process of repeatedly verbalizing or thinking about the information.*

For example - late at night, you have been out partying all night, you et back home and you are hungry. you decide...it's time for pizza. So you pick up the phone and call information to get the number of a local pizza delivery place. When the operator gives the number, you say the number over and over so that you don't forget it in the time it takes to hang up and dial the number. This process of repeating the number over and over is actually maintenance rehearsal. It won't help get the information into long term memory, but it will help keep it in short term memory a little longer.

2) Slots - STM seems to be divided into "slots" - to be precise, STM has 7 slots, each one capable of holding one piece of information.

This is also commonly referred to as the MAGIC #7 (+/- 2), which was introduced by George Miller.

But, we are bombarded with so much information all the time that STM can become cluttered. In order to prevent the clutter from become too much, STM pushes some information out in order to make room for other information. But what gets pushed out???

3) Primacy and Recency

a) Primacy - when you are receiving information, the information perceived first is more likely to be remembered. This more recent information may simply get to long term memory more easily, and thus be remembered or we may just rehearse the early information more.

b) Recency - information perceived toward the end of an event is also more likely to be remembered. So, information in the "middle" seems to get pushed out and is less likely to be remembered.

While maintenance rehearsal will help keep information in STM, the only way to bring information into long-term memory is through ELABORATIVE REHEARSAL.

4) Elaborative Rehearsal - *connecting new information with previously stored, already existing associative structures*.

For Example - when our sixth grade teachers used to make us put a vocabulary word into context in a sentence - this combines the new information (the vocabulary word) with an associative structure (the sentence).

"Johnny, the word is pimple. Can you use pimple in a sentence?" "Yes. My head is so full of all of this Psychological information, I think it is going to pop like a big, white, pimple"

C. Long Term Memory (LTM) - *an unlimited capacity store that can hold information over lengthy periods of time*.

The name is a bit of a misnomer, since information in LTM may stay there over the course of a life-span.

1) there are 3 categories (or subcategories) of LTM:

a) *Procedural memory* - this is the most basic type of long term memory (very simplistic) and primarily involves memories of rudimentary procedures and behaviors.

For example - procedural memories include our memory for eating, sitting in a chair, etc. As you can see, these are are based on behavior.

some even suggest that there is an additional, basic category called DECLARATIVE memory - just factual information like names and dates.

b) *Semantic memory* - mental models of the environment as well as procedures.

For example - knowledge of word meanings, language, strategies for problem solving, factual information (like laws), etc.

c) *Episodic memory* - information about events, people, places, etc., that include an autobiographical aspect as well as a time and place.

For example - "I saw a bear last night in my back yard."

Now that we have seen how memory works, let's look at how or why memory may NOT work.

Theories of Forgetting are:

1) *Decay* - forgetting due to memories fading over time. This does NOT apply to LTM.

This often occurs in sensory storage and STM since we do not need to process and store all the information that we encounter. As a result, there is a lot of information we don't attend to, recognize, or rehearse, and so it simply fades away.

2) *Interference* - hindrance of learning new information because of other information learned before or after the new information. There are two types:

a) Proactive interference - information learned previously causes problems with new information.

b) Retroactive interference - new information cause recall problem with previously learned information.

3) *Retrieval-Based Forgetting* - information stored in LTM is not being accessed or brought out properly; however, if given enough time or cues, it is possible to retrieve the information.

a) this suggests that LTM is permanent. Since the information is said to still be in LTM and not lost (the person has the information but just can't get to it).

4) *Storage-Based Forgetting* - information in LTM was distorted, altered, or changed so it is no longer accessible when searching for what it "used to be". The information can be retrieved, but only if you look for it in its new form.

5) *Motivated Forgetting* - a purposeful process of blocking or "suppressing" information.

a) FREUD referred to this as Repression - keeping distressing thoughts or feelings buried in the unconscious.

BUT - can we actually intentionally forget something?

Here is a quick HOMEWORK assignment - do whatever you must do to forget the number sequence 5-3-1. Try as hard as you can to forget it - do what you must, but forget the number sequence 5-3-1!!

When a repressed memory is remembered, we say it has been Recovered. A recovered memory can be defined as the emergence of a formerly repressed memory.

8.4. *The PQ4R method* is a method that individuals can use to help them better comprehend written material. It is a strategy that helps individuals focus on orgainizing information in their minds and making it meaningful. The steps for PQ4R are described below.

PQ4R	
Preview	Survey the material to get an idea of the general orgainization, major topics and subtopics. Look at headings and pictures to try to identify what you will be reading about.
Question	Ask questions about the material as you read it. Use headings to ask questions (who, what, why, where)
Read	Read the material. Try to answer your own questions while reading.
Reflect	Think about the material that you just read and try to make it meaningful by: 1)relating it to things that you already know about, 2)relating the subtopics to primary topics, 3)trying to resolve contradictions, 4) trying to use the material to solve simulated problems.
Recite	Practice remembering the information by stating points aloud and asking and answering questions. Use headings, highlighted words and notes on major ideas.
Review	Actively review the material, focusing on asking yourself questions and rereading the material only when you are not sure of the answers.

Lecture 9

Cognitive psychology: Thinking, Reasoning, Language, Intelligence

9.1. Thinking. Forming concepts. Solving problems. Problem-solving strategies.
9.2. Creative problem-solving model: Creative and Critical Thinking.
9.3. Decision-making strategies. The Psychology of Reasoning.
9.4. The concept of Language. Its organizational rules.
9.5. The concept of Intelligence. Test Construction Criteria. Intelligence tests: Stanford-Binet Intelligence Scale.

Key notions: *psychology of thought, concept formation, prototype, overgeneralising, conjunctive concept, problem-solving, Algorithms, Heuristics, Trial-and-Error strategy, Insight strategy, Creative thinking, Critical thinking, decision-making, psychology of reasoning, inductive and deductive reasoning, psychology of language, psychology of intelligence, standardization, reliability, and validity, intelligence tests, Stanford-Binet Test*

9.1. Thought generally refers to any mental or intellectual activity involving an individual's subjective consciousness. It can refer either to the act of thinking or the resulting ideas or arrangements of ideas.Thinking allows beings to make sense of or model the world in different ways, and to represent or interpret it in ways that are significant to them, or which accord with their needs, attachments, objectives, plans, commitments, ends and desires.

Forming concepts

Our thinking is fueled by *concepts*. When we think about the world one of the ways that we organise our thoughts is by putting them into categories. This process of developing categories is called ***concept formation***. For example 'animal' is a concept that contains other sub-concepts and then further sub-concepts. We could divide animals into birds, fish, mammals, etc. We could then divide birds into robins, sparrows, owls, etc. When we apply our concepts we tend to use a set of defining features. For example we would classify the sparrow as a bird because it has a number of defining features that we associate with birds such as wings, feathers, beaks and flying. However although we may have a set of defining features for a concept such as a bird we don't apply these rigidly. Penguins and ostriches are still classified as birds even though they don't fly.

People tend to use a **prototype**, a model of a concept, to typify members of a particular category. The prototype any particular individual uses depends on that individual's experience. Your prototype of "dog," for example, might be a longhaired, medium-size, long-muzzled, black and white, tail-wagging animal, and you would tend to classify dogs that you encounter as in various ways being the same as or different from your prototypical dog.

We use concepts so automatically that we are rarely aware that we are using them. Perhaps it is easier to see this process in action when we observe children developing their thinking as they struggle to develop concepts. Children often make mistakes by ***overgeneralising*** a concept that they are trying to get to grips with. They may have developed a concept for a dog as an animal with hair, four legs and a tail, but then they may also apply this label to a cat or a sheep or even a horse. Similarly they may learn that the tall person with the deep voice is called Daddy and then may embarrassingly identify any passing man as Daddy.

Natural concepts are often learned through the use of prototypes, highly typical examples of a category-like the robin cited above. The other major method of concept learning is through the trial-and-error method of testing hypotheses. People will guess or assume that a certain item is an instance of a particular concept; they then learn more about the concept when they see whether their hypothesis is correct or not.

People learn simple concepts more readily than complex ones. For example, the easiest concept to learn is one with only a single defining feature. The next easiest is one with multiple features, all of which must be present in every case, known as the ***conjunctive concept***. In conjunctive concepts, and links all the required attributes. For example, the concept square is defined by four sides and four 90-degree angles. It is more difficult to master a so-called disjunctive concept, when either one feature or another must be present. People also learn concepts more easily when they are given positive rather than negative examples of a concept (e.g., shown what it is rather than what it is not).

In cognitive psychology, the term *problem-solving* refers to the mental process that people go through to discover, analyze and solve problems. This involves all of the steps in the problem process, including the discovery of the problem, the decision to tackle the issue, understanding the problem, researching the available options and taking actions to achieve your goals. Before problem-solving can occur, it is important to first understand the exact nature of the problem itself. If your understanding of the issue if faulty, your attempts to resolve it will also be incorrect or flawed.

There are a number of different *mental process* at work during *problem-solving*. These include:

- *Perceptually recognizing a problem*
- *Representing the problem in memory*
- *Considering relevant information that applies to the current problem*
- *Identify different aspects of the problem*
- *Labeling and describing the problem*

Problem-Solving Strategies

- ***Algorithms*:** An algorithm is a step-by-step procedure that will always produce a correct solution. A mathematical formula is a good example of a problem-solving algorithm. While an algorithm guarantees an accurate answer, it is not always the best approach to problem solving. This strategy is not practical for many situations because it can be so time-consuming. For example, if you were trying to figure out all of the possible number combinations to a lock using an algorithm, it would take a very long time!
- ***Heuristics*:** A heuristic is a mental rule-of-thumb strategy that may or may not work in certain situations. Unlike algorithms, heuristics do not always guarantee a correct solution. However, using this problem-solving strategy does allow people to simplify complex problems and reduce the total number of possible solutions to a more manageable set.
- ***Trial-and-Error*:** A trial-and-error approach to problem-solving involves trying a number of different solutions and ruling out those that do not work. This approach can be a good option if you have a very limited number of options available. If there are many different choices, you are better off narrowing down the possible options using another problem-solving technique before attempting trial-and-error.
- ***Insight*:** In some cases, the solution to a problem can appear as a sudden insight. According to researchers, insight can occur because you realize that the problem is actually similar to something that you have dealt with in the past, but in most cases the underlying mental processes that lead to insight happen outside of awareness.

9.2. The model developed by Scott Isaksen and Donald Treffinger as described in the book "Creative Problem Solving: The Basic Course (1985) by Isaksen and Treffinger" and published in Buffalo, New York, by Bearly Limited describes both critical thinking and creative thinking. *Creative thinking* is described as making and communicating connections to: think of many possibilities; think and experience in various ways and use different points of view; think of new and unusual possibilities; and guide in generating and selecting alternatives. *Critical thinking* is described as analyzing and developing possibilities to: compare and contrast many ideas; improve and refine ideas; make effective decisions and judgments; and provide a sound foundation for effective action. These definitions are used in a six-stage, problem-solving process. A brief description of each of the six stages follows:

1. **Mess Finding:** Just what's the mess that needs cleaning up, the situation that demands our attention? We have to identify and acknowledge this first before we can proceed.
2. **Data Finding:** Once the general mess is defined, the next stage involves "taking stock"--unearthing and collecting information, knowledge, facts, feelings, opinions, and thoughts to sort out and clarify your mess more specifically. What do you know about the situation, and what do you still need to know?
3. **Problem Finding:** Now that your data is collected, you need to formulate a "problem statement" that expresses the "heart" of the situation. You must try to put aside the common assumption that you "already know what the problem is" and try to state the problem in such a manner as to invite novel perspectives on it.

4. **Idea Finding:** This is the state in which you brainstorm as many ideas or alternatives as possible for dealing with your problem statement. Don't evaluate your ideas at this point, merely list them as an idea pool from which you'll draw in putting together a variety of solutions to your problem.
5. **Solution Finding:** Now that you have a number of ideas that can serve as possible solutions to your problem, it's time to evaluate them systematically. To do this you have to generate a variety of criteria and select the most important for your problem. Is it cost? expediency? pleasure? time involvement? etc. In this way, you'll be able to identify and evaluate the relative strengths and weaknesses of possible solutions.
6. **Acceptance Finding:** Having decided upon a solution, it's time to formulate a plan of action to implement your solution. Determine what kind of help you'll need, what obstacles or difficulties might get in the way, and what specific short- and long-term steps you are going to take to rid yourself of that original mess!

No one always acts purely objectively and rationally. We connive for selfish interests. We gossip, boast, exaggerate, and equivocate. It is "only human" to wish to validate our prior knowledge, to vindicate our prior decisions, or to sustain our earlier beliefs. In the process of satisfying our ego, however, we can often deny ourselves intellectual growth and opportunity. We may not always want to apply critical thinking skills, but we should have those skills available to be employed when needed.

Critical thinking includes a complex combination of skills. Among the main characteristics are the following:

Rationality

We are thinking critically when we

- rely on reason rather than emotion,
- require evidence, ignore no known evidence, and follow evidence where it leads, and
- are concerned more with finding the best explanation than being right analyzing apparent confusion and asking questions.

Self-awareness

We are thinking critically when we

- weigh the influences of motives and bias, and
- recognize our own assumptions, prejudices, biases, or point of view.

Honesty

We are thinking critically when we recognize emotional impulses, selfish motives, nefarious purposes, or other modes of self-deception.

Open-mindedness

We are thinking critically when we

- evaluate all reasonable inferences
- consider a variety of possible viewpoints or perspectives,
- remain open to alternative interpretations
- accept a new explanation, model, or paradigm because it explains the evidence better, is simpler, or has fewer inconsistencies or covers more data
- accept new priorities in response to a reevaluation of the evidence or reassessment of our real interests, and
- do not reject unpopular views out of hand.

Discipline
We are thinking critically when we

- are precise, meticulous, comprehensive, and exhaustive
- resist manipulation and irrational appeals, and
- avoid snap judgments.

Judgment
We are thinking critically when we

- recognize the relevance and/or merit of alternative assumptions and perspectives
- recognize the extent and weight of evidence

In sum,

- Critical thinkers are by nature**skeptical**. They approach texts with the same skepticism and suspicion as they approach spoken remarks.
- Critical thinkers are**active**, not passive. They ask questions and analyze. They consciously apply tactics and strategies to uncover meaning or assure their understanding.
- Critical thinkers do not take an egotistical view of the world. They are**open**to new ideas and perspectives. They are willing to challenge their beliefs and investigate competing evidence.

Critical thinking enables us to recognize a wide range of subjective analyses of otherwise objective data, and to evaluate how well each analysis might meet our needs. Facts may be facts, but how we interpret them may vary.

9.3. ***Decision making is the study of identifying and choosing alternatives based on the values and preferences of the decision maker.*** Making a decision implies that there are alternative choices to be considered, and in such a case we want not only to identify as many of these alternatives as possible but to choose the one that (1) has the highest probability of success or effectiveness and (2) best fits with our goals, desires, lifestyle, values, and so on. ***Decision making is the process of sufficiently reducing uncertainty and doubt about alternatives to allow a reasonable choice to be made from among them.*** This definition stresses the information-gathering function of decision making. It should be noted here that uncertainty is *reduced* rather

than eliminated. Very few decisions are made with absolute certainty because complete knowledge about all the alternatives is seldom possible.

There are often many solutions to a given problem, and the decision maker's task is to choose one of them. The task of choosing can be as simple or as complex as the importance of the decision warrants, and the number and quality of alternatives can also be adjusted according to importance, time, resources and so on. There are *several strategies* used for choosing. Among them are the following:

1. Optimizing. This is the strategy of choosing the best possible solution to the problem, discovering as many alternatives as possible and choosing the very best. How thoroughly optimizing can be done is dependent on

A. importance of the problem
B. time available for solving it
C. cost involved with alternative solutions
D. availability of resources, knowledge
E. personal psychology, values

Note that the collection of complete information and the consideration of all alternatives is seldom possible for most major decisions, so that limitations must be placed on alternatives.

2. Satisficing. In this strategy, the first satisfactory alternative is chosen rather than the best alternative. If you are very hungry, you might choose to stop at the first decent looking restaurant in the next town rather than attempting to choose the best restaurant from among all (the optimizing strategy). The word *satisficing* was coined by combining *satisfactory* and *sufficient*. For many small decisions, such as where to park, what to drink, which pen to use, which tie to wear, and so on, the satisficing strategy is perfect.

3. Maximax. This stands for "maximize the maximums." This strategy focuses on evaluating and then choosing the alternatives based on their maximum possible payoff. This is sometimes described as the strategy of the optimist, because favorable outcomes and high potentials are the areas of concern. It is a good strategy for use when risk taking is most acceptable, when the go-for-broke philosophy is reigning freely.

4. Maximin. This stands for "maximize the minimums." In this strategy, that of the pessimist, the worst possible outcome of each decision is considered and the decision with the highest minimum is chosen. The Maximin orientation is good when the consequences of a failed decision are particularly harmful or undesirable. Maximin concentrates on the salvage value of a decision, or of the guaranteed return of the decision. It's the philosophy behind the saying, "A bird in the hand is worth two in the bush."

Decision Making includes several procedures:

1. Identify the decision to be made together with the goals it should achieve. Determine the scope and limitations of the decision. When thinking about the decision, be sure to include a clarification of goals.

2. Get the facts. But remember that you cannot get all the facts. Get as many facts as possible about a *decision within the limits of time imposed on you and your ability to process them*, but remember that virtually every decision must be made in partial ignorance. Lack of complete information must not be allowed to paralyze your decision. A decision based on partial knowledge is usually better than not making the decision when a decision is really needed. The proverb that "any decision is better than no decision," while perhaps extreme, shows the importance of choosing.

3. Develop alternatives. Make a list of all the possible choices you have, including the choice of doing nothing. Not choosing one of the candidates or one of the building sites is in itself a decision. Often a non decision is harmful as we mentioned above--not choosing to turn either right or left is to choose to drive into the bridge. But sometimes the decision to do nothing is useful or at least better than the alternatives, so it should always be consciously included in the decision making process.

4. Rate each alternative. This is the evaluation of the value of each alternative. Consider the negative of each alternative (cost, consequences, problems created, time needed, etc.) and the positive of each (money saved, time saved, added creativity or happiness to company or employees, etc.). Remember here that the alternative that you might like best or that would in the best of all possible worlds be an obvious choice will, however, not be functional in the real world because of too much cost, time, or lack of acceptance by others.

5. Rate the risk of each alternative. In problem solving, you hunt around for a solution that best solves a particular problem, and by such a hunt you are pretty sure that the solution will work. In decision making, however, there is always some degree of uncertainty in any choice.

6. Make the decision. If you are making an individual decision, apply your preferences (which may take into account the preferences of others). Choose the path to follow, whether it includes one of the alternatives, more than one of them (a multiple decision) or the decision to choose none.

The **psychology of reasoning** is the study of how people reason, often broadly defined as the process of drawing conclusions to inform how people solve problems and make decisions.

Inductive and deductive reasoning are two methods of logic used to arrive at a conclusion based on information assumed to be true. Both are used in research to establish hypotheses.

Deductive reasoning arrives at a specific conclusion based on generalizations. Inductive reasoning takes events and makes generalizations.Deductive reasoning is reasoning that involves a hierarchy of statements or truths. Starting with a limited number of simple statements or assumptions, more complex statements can be built up from the more basic ones. For example, you have probably studied deductive geometry in mathematics; in it you start with a few principles and prove various propositions using those principles. To prove more complicated propositions, you may use propositions that you have already proved plus the original principles. In more formal logic terms deductive reasoning is reasoning from stated premises to conclusions formally or necessarily implied by such premises.

Deductive reasoning can be described as reasoning of the form if A then B. Deduction is in some sense the direct application of knowledge in the production of new knowledge.

If-then deductive reasoning is how scientists (and other people!) can test alternate hypotheses. Making deductions is important when we cannot directly observe a cause, and can only observe its consequences. This kind of reasoning can be modeled by the following:

If …

Then...

But...

Therefore...

Inductive reasoning is essentially the opposite of deductive reasoning. It involves trying to create general principles by starting with many specific instances. This is the kind of reasoning used if you have gradually built up an understanding of how something works.
Inductive reasoning progresses from observations of individual cases to the development of a generality. (Inductive reasoning, or induction, is often confused with deductive thinking; in the latter, general principles or conditions are applied to specific instances or situations.) If a child puts his or her hand into a bag of candy and withdraws three pieces, all of which are red, he or she may conclude that all the candy is red. Inductive reasoning, or induction, is the process by which a general conclusion is reached from evaluating specific observations or situations.
Many people distinguish between two basic kinds of argument: inductive and deductive. Induction is usually described as moving from the specific to the general, while deduction begins with the general and ends with the specific; arguments based on experience or observation are best expressed inductively, while arguments based on laws, rules, or other widely accepted principles are best expressed deductively.

9.4. ***Language*** implies any means of conveying or communicating ideas; specifically, human speech; the expression of ideas by the voice; sounds, expressive of thought, articulated by the organs of the throat and mouth. Language may refer either to the specifically human capacity for acquiring and using complex systems of communication, or to a specific instance of such a system of complex communication.

One definition sees *language* primarily as the mental faculty that allows humans to undertake linguistic behaviour: to learn languages and produce and understand utterances. This definition stresses the universality of language to all humans and the biological basis of the human capacity for language as a unique development of the human brain. These kinds of definitions are often applied by studies of language within a cognitive science framework and in neurolinguistics.

Another definition sees *language* as a formal system of signs governed by grammatical rules of combination to communicate meaning. This definition stresses the fact that human languages can be described as closed structural systems consisting of rules that relate particular signs to particular meanings.

Yet another definition sees *language* as a system of communication that enables humans to cooperate. This definition stresses the social functions of language and the fact that humans use it to express themselves and to manipulate objects in their environment.

Language is characterized by a number of organizational rules that include *phonology, morphology, syntax, and semantics.*

The ways in which spoken languages use *sounds* to construct meaning is studied in phonology. The study of how humans produce and perceive vocal sounds is called phonetics. In spoken language meaning is constructed when sounds become part of a system in which some sounds can contribute to expressing meaning and others do not. In any given language only a limited number of the many distinct sounds that can be created by the human vocal apparatus contribute to constructing meaning.Apart from segments such as consonants and vowels, some languages also use sound in other ways to convey meaning.

Many languages use the *morphological processes* of inflection to modify or elaborate on the meaning of words. Furthermore morphology distinguishes between processes of inflection which modifies or elaborates on a word, and derivation which instead creates a new word from an existing one - for example in English "sing" which can become "singer" by adding the derivational morpheme -er which derives an agentive noun from a verb.

Languages that use inflection to convey meaning often do not have strict rules for word order in a sentence. For example in English the two sentences "the slaves were cursing the master" and "the master was cursing the slaves" mean different things

because the role of grammatical subject is encoded by the noun being in front of the verb and the role of object is encoded by the noun appearing after the verb.

Syntax then, has to do with the order of words in sentences, and specifically how complex sentences are structured by grouping words together in units, called phrases, that can occupy different places in a larger syntactic structure. Below is a graphic representation of the syntactic analysis of the sentence "the cat sat on the mat". The sentence is analysed as being constituted by a noun phrase, a verb and a prepositional phrase; the prepositional phrase is further divided into a preposition and a noun phrase; and the noun phrases consist of an article and a noun.

Languages express meaning by relating a sign to a meaning (semantics). Thus languages must have a vocabulary of signs related to specific meaning—the English sign "dog" denotes, for example, a member of the genus *Canis*. In a language, the array of arbitrary signs connected to specific meanings is called the lexicon, and a single sign connected to a meaning is called a lexeme. Not all meanings in a language are represented by single words-often semantic concepts are embedded in the morphology or syntax of the language in the form of grammatical categories.

9.5. ***Intelligence*** has been defined in different ways, including the abilities for abstract thought, understanding, communication, reasoning, learning, planning, emotional intelligence and problem solving.

How to define intelligence is controversial. Groups of scientists have stated the following:

1. from "Mainstream Science on Intelligence" (1994), an editorial statement by fifty-two researchers:

   A very general mental capability that, among other things, involves the ability to reason, plan, solve problems, think abstractly, comprehend complex ideas, learn quickly and learn from experience. It is not merely book learning, a narrow academic skill, or test-taking smarts. Rather, it reflects a broader and deeper capability for comprehending our surroundings—"catching on," "making sense" of things, or "figuring out" what to do.

2. from "Intelligence: Knowns and Unknowns" (1995), a report published by the Board of Scientific Affairs of the American Psychological Association:

   Individuals differ from one another in their ability to understand complex ideas, to adapt effectively to the environment, to learn from experience, to engage in various forms of reasoning, to overcome obstacles by taking thought. Although these individual differences can be substantial, they are never entirely consistent: a given person's intellectual performance will vary on different occasions, in different domains, as judged by different criteria. Concepts of "intelligence" are attempts to clarify and organize this complex set of phenomena. Although considerable clarity has been achieved in some areas, no such conceptualization has yet answered all the important questions, and

none commands universal assent. Indeed, when two dozen prominent theorists were recently asked to define intelligence, they gave two dozen, somewhat different definitions.

Intelligence is often defined as a measure of general mental ability. Of the standardized ***intelligence tests***, those developed by David Wechsler are among those most widely used. Wechsler defined intelligence as "the global capacity to act purposefully, to think rationally, and to deal effectively with the environment." While psychologists generally agree with this definition, they don't agree on the **operational definition** of intelligence (that is, a statement of the procedures to be used to precisely define the variable to be measured) or how to accomplish its measurement.

To be useful, *tests*, including intelligence tests, *must be constructed* using the established criteria of ***standardization, reliability, and validity***.

1) ***Standardization*** is the process of making uniform and objective both testing procedures and scoring procedures in order to obtain meaningful scores. Scores on standardized tests are interpreted in reference to scores obtained from a standardization sample, that is, scores from a comparable group of subjects tested under appropriate conditions.

The term ***reliability*** refers to the consistency of results. Reliability of a test is determined by one of the following methods.

a) *test and retest reliability*: comparison of original test scores with retest scores

b) *alternate form reliability*: comparison of scores obtained on alternate forms of a test

c) *split-half reliability*: comparison of scores obtained on two halves of tests (such as scores on odd- versus even-numbered questions)

The term ***validity*** refers to the extent that a test measures what it is supposed to measure. Types of validity include

a) *content validity*: the extent to which a test reflects a sample of the behavior to be measured

b) *predictive validity*: the extent to which a test can predict a person's behavior in another situation

c) *face validity*: how appropriate a test "appears" to be, just from the way the items read

d) *construct validity*: how well a test assesses the construct (for example, intelligence) for which it was designed

e) *concurrent validity*: how well the results of a test agree with those of a new test or a different form of the test measuring for the same construct (for example, intelligence)

Intelligence tests attempt to measure your intelligence—that is, your basic ability to understand the world around you, assimilate its functioning, and apply this knowledge to enhance the quality of your life. Or, as Alfred Whitehead said about intelligence, "it enables the individual to profit by error without being slaughtered by it." Intelligence, therefore, is a measure of a *potential*. The challenge is to design a test that can actually be culture-free.

The concept of *IQ* derives from about 1916 when a Stanford University psychologist, Lewis Terman, translated and revised the intelligence scale created by Alfred Binet and Theodore Simon. Hence the name of the new instrument, the *Stanford-Binet Intelligence Scale*. In this instrument, Terman used the ratio of *mental age* to *chronological age*. This ratio—or quotient—concept led to the use of the term IQ (Intelligence Quotient). For example, a six year old child with a mental age of 6 would have an IQ of 100 (the "average" IQ score); a six year old child with a mental age of 9 would have an IQ of 150. Today, intelligence is measured according to individual deviation from standardized norms, with 100 being the average.

The development of the Stanford-Binet Intelligence Scales initiated the modern field of intelligence testing, originating in France, then revised in the U.S. The Stanford-Binet test started with the French psychologist Alfred Binet (1857-1911), whom the French government commissioned with developing a method of identifying intellectually deficient children for their placement in special-education programs. As Binet indicated, case studies might be more detailed and helpful, but the time required to test many people would be excessive. In 1916, at Stanford University, the psychologist Lewis Terman released a revised examination which became known as the "Stanford-Binet test".

Binet broke down his scale, for mental deficiency, into categories that he gave classical-language names that were considered scientific at the time, but became common pejoratives for regular people, until the psychology industry eventually abandoned them.

Binet Scale of Human Intelligence		
IQ Score	**Original Name**	**Modern Term**
Over 140	Genius or Near-Genius	
120 - 139	Very Superior	
110 - 119	Superior	
90 - 109	Average or Normal	
80 - 89	Dull	Dull Normal
70 - 79	Borderline Deficiency	Mild
50 - 69	Moron	Moderate
20 - 49	Imbecile	Severe
Below 20	Idiot	Profound

Stanford-Binet Test: Alfred Binet (in collaboration with Theodore Stanford) was instructed by the French government to design a test that would identify children who would have problems with school and or learning the material that was designed for children in their own age range. A widely used intelligence test. They then set out to create a test that measures a child's mental age (the average mental ability for a child of a specific chronological age). They could use this mental age as a guide, to see if, for example, a 5 year old has "normal" intelligence, which would be a mental age of 5, or a mental age that was above or below. The test does not identify why children perform above or below a specific age range, only at what mental age a child performs. The test does however, according to its creators, measure how well a child of a specific age will be able to handle school work designed for children of similar age.