

PSY 151B: INTRODUCTION TO PSYCHOLOGY (L-T-P-D-[C] 3-1-0-0-[4])
(2020 – 2021, I Semester)

Instructors: Prof. Braj Bhushan (brajb@iitk.ac.in)

Prof. Shikha Dixit (shikha@iitk.ac.in)

Course Content

Modules →	Chapters
Module 1	Nature of Psychology
Module 2	Approaches and History of Psychology
Module 3	Perception
Module 4	Memory
Module 5	Learning
Module 6	Intelligence
Module 7	Emotion
Module 8	Personality
Module 9	Methods of Psychology

For tutorials, students will be divided into two groups with one Tutor each. Both instructors will be present along with the tutors respectively for the two groups.

Conduct of online classes and tutorials—

1. Lectures will be released on Mondays every week on mooKIT. The lectures for the first module will be released as soon as mooKIT will be open for students.
2. Students are supposed to watch the videos/ listen to audio as the case may be.
3. Discussion session will be held online on Mondays from 8-9 am.
4. Tutorials will be held online on Thursdays from 8-9 am.
5. Zoom link for joining the meeting will be sent at course alias for discussion session and tutorials.
6. Online quizzes, mid-semester and end-semester examinations will be held.

Grading policy* —

Quizzes (3) - 30%

Mid-semester exam - 30%

End-semester exam - 35%

Participation - 5%

Books:

1. **Introduction to Psychology**
Adapted by Martha Lally and Suzanne Valentine-French
<http://dept.clcillinois.edu/psy/IntroductionToPsychologyText.pdf>
2. **OpenStax Introduction to Psychology by Spielman et al.**
<https://openstax.org/details/psychology>
3. **Introduction to Psychology**
By Clifford Morgan , Richard King, John Weisz , [John Schopler](#)
7th Edition, McGraw – Hill Book Co.

An e-book link will be shared later if provided by the Institute.

*One of the components of evaluation would be oral

IMPORTANT: Copyright Clause

The instructors of this course own the copyright of all the course materials. However, some of the lectures in this course were created as part of NPTEL/MOOCs. This lecture material was distributed only to the students attending the course PSY 151B: INTRODUCTION TO PSYCHOLOGY of IIT Kanpur, and should not be distributed in print or through electronic media without the consent of the instructors. Students can make their own copies of the course materials for their use.

Shikha Dixit

Professor of Psychology, Department of
Humanities & Social Sciences, Indian Institute of
Technology Kanpur, Kanpur- 208016, U.P., India

Email: shikha@iitk.ac.in



PSY151: Introduction to Psychology

Lecture 1: The Nature of Psychology – Introduction



Why do we need to study Psychology?

- ▶ A course in introduction to psychology will help in understanding various aspects of self and others (Behavioral aspects)
- ▶ Examples:
- ▶ Understanding mental processes such as perception and memory
- ▶ What is learning? What is the effect of rewards on learning?
- ▶ Understanding others: Why do people behave the way they do?
- ▶ What is the nature of intelligence?
- ▶ How do we understand emotions?



- ▶ A Question: What are some of the problems we are facing today?
- ▶ By studying psychology, what can we learn about these problems?



What are your answers?

- ▶ Most people would include: Disease, terrorism, discrimination, mental health etc.
- ▶ HOW IS PSYCHOLOGY RELEVANT?



Examples

- ▶ Pandemics: Psychological issues
- ▶ Terrorism: Attitudes (religion, violence), personality, psychopathology
- ▶ Mental Health: Stress, anxiety, depression
- ▶ Health: Behavior modification – stop smoking, healthy eating habits, treatment adherence etc.

Psychology is therefore involved in human affairs in various ways



Defining Psychology

- ▶ Difficult to provide a DEFINITION
- ▶ Range and scope is very wide
- ▶ “...the science of human behavior and cognitive processes.” (Baron, 1999, p. 3)
- ▶ Most definitions include the following aspects
 1. Focus on human behavior
 2. Animal behavior
 3. Methods for studying behavior
- ▶ Psychology is a science, a discipline and a profession



Fast Growing Field

- ▶ Psychology is the scientific study of behavioural processes such as learning, perception, motivation and emotion etc.
- ▶ Fast growing and ever changing field of study
- ▶ Brain imaging, neuroscience studies and cultural basis of psychological processes
- ▶ Rapid and diverse changes and advances
- ▶ Constant advances in the study of human behaviour, animal behaviour, and brain processes linked to behaviour



Animal Behaviour

- ▶ Why is animal behavior important?
 - a) Learning about basic processes (physiology)
 - b) Genetic studies
 - c) Animals are easily available; life span is short
 - d) Ease of experimental manipulation.
Example, Harry F. Harlow's work with monkeys. Newborn monkeys were separated from mothers at birth and reared in isolation with inanimate surrogate mothers
 - e) Ethical considerations are important



Is psychology a science?

- ▶ Objective Approach
- ▶ Scientific Method
- ▶ Measurement of variables
- ▶ Systematic observation
- ▶ Use of experimentation and other scientific methods



Studying Behavior

- ▶ Why do we need to study behavior in a scientific manner?
 - How adequate is commonsensical psychological approach?
- ▶ What are the levels of studying behavior?
 - Nomothetic and idiographic



Answering the first question

Commonsensical approach ?

- ▶ We have theories about human behavior
- ▶ We use generic theories in daily life
- ▶ Relating causes and consequences of behavior
- ▶ Prediction and hindsight bias



Inadequacy of commonsense approach

- ▶ It is not scientific
- ▶ Assumptions and conclusions – not valid
- ▶ Cultural/ personal biases and prejudices might creep in
- ▶ Observations are not systematic
- ▶ Information is not examined in a scientific way



Levels of Study

Nomothetic and Idiographic psychology

- ▶ Nomothetic psychology: Establishing universal laws of behavioral processes

Study of generalized patterns of behavior places individuals in fixed slots and denies the differences that lead to uniqueness

- ▶ Idiographic psychology: Importance of uniqueness.
Each individual should be understood in terms of his/ her uniqueness



Idiographic psychology

- ▶ Studying a large number of individuals from the idiographic point of view is difficult and time consuming
- ▶ Research oriented clinical psychologists and counselors might adopt nomothetic approach



Some questions to think –

Why is psychology useful?

What is the definition of Psychology?

Is psychology a science?

Why is animal behavior important in psychology?

Are commonsensical psychological notions scientific?

What is nomothetic psychology?

What is idiographic psychology/



Thank you



Shikha Dixit

Professor of Psychology, Department of
Humanities & Social Sciences, Indian Institute of
Technology Kanpur, Kanpur- 208016, U.P., India

Email: shikha@iitk.ac.in

PSY151: Introduction to Psychology

Lecture 2: The Nature of Psychology -

Themes/ Debates and Work of Psychologists

Recapitulation – Lecture 1

- ▶ What is psychology all about?
- ▶ Why we need to study psychology?
- ▶ Discussion of examples to understand how psychology is relevant in today's world?
- ▶ Basic definition of psychology acceptable to most psychologists.
- ▶ In what ways psychology is a science?
- ▶ How scientific psychology is different from everyday common sense psychological notions and intuitions?
- ▶ The difference between nomothetic and idiographic psychology.

- ▶ In the second lecture the focus of discussion will be on the work of psychologists.
- ▶ There are various aspects of work of psychologists and we will discuss some of these
- ▶ Themes and debates in psychology
- ▶ Psychologists and psychiatrists
- ▶ Basic and applied psychology

Themes/ Debates

- ▶ There are some themes and major questions that psychologists address
- ▶ Psychology has evolved in terms of its history
- ▶ Some of the themes and questions are still quite pertinent
 - Nature vs. Nurture
 - Commonalities vs. Differences
 - Automatic vs. Controlled processing
 - Free will vs. Determinism

Nature vs. Nurture

- ▶ To what extent our behaviour is governed by heredity and biological endowment and to what extent it is governed by environmental inputs, experience and learning contexts
- ▶ Scholars who argue in favour of genetics or heredity are known as *nativists* whereas those scholars who place importance on the role of learning and environment are known as *empiricists*

- ▶ Most psychologists agree that there is no one clear and final answer to the nature – nurture debate
- ▶ It is difficult say whether environment or heredity dominates
- ▶ Many aspects of behaviour are best understood in terms of interaction between the two

Commonalities vs. differences

- ▶ In many ways human beings are similar to each other and they are also different
- ▶ Nomothetic and Idiographic approaches
- ▶ People differ with reference to their abilities, intelligence and personality. But people are similar in many ways (universal laws)

- ▶ In addition to individual differences due to uniqueness that are understood by psychologists who study personality and intelligence, differences also exist due to different cultures, ethnicities and environmental factors
- ▶ It is important to recognize and study differences in behaviours occurring due to cultural diversity, gender, socio economic status and other contexts

Cultural relativism

- ▶ Bias may occur if cultural differences are not recognized and understood
- ▶ Social scientists practice **Cultural relativism** to deal with bias – Cultural relativism refers to taking into account beliefs and behaviours due to culture

Automatic vs. Controlled processing of information

- ▶ Unconscious vs. conscious processing of information
- ▶ A wide variety of cognitive processes occur due to automaticity without conscious awareness or intention. These processes are called automatic or unconscious processes
- ▶ Conscious or controlled information processing is intentional and within conscious awareness

- ▶ Unconscious processing occurs in social domain also
- ▶ In social sense automatic and unintentional processing leads to decisions and judgments in the social context
- ▶ Ex: Gender stereotypes may get activated in social situations and without conscious realization

Free will vs. Determinism

- ▶ Broadly, this debate is related to the question that to what extent human behaviour is governed by personal choice and the capacity to make independent decisions and choices without any constraint
- ▶ Free will – Human beings can make choices freely and can thus exercise freedom and dignity in responding to situations

- ▶ Determinism – opposite to the view of free will
- ▶ Determinism argues that human behaviour is determined by factors that are not under control of individuals
- ▶ Ex: Environmental determinism and biological determinism

- ▶ Free will is very subjective, philosophical and not in accordance with scientific approach
- ▶ Determinism removes freedom and dignity of human choice, is reductionistic in its approach as it reduces individual responsibility

Holistic vs. Reductionistic approaches

- ▶ Holistic approach – behaviour can be understood as a whole without breaking it down into components parts
- ▶ Reductionistic – behaviour can be studied by studying its structure or components

Work of psychologists

- ▶ In the remaining part of this lecture we will focus on the work of psychologists
- ▶ We will understand the difference between
 - Psychologists and psychiatrists
 - Basic and applied psychology
- ▶ We will briefly discuss Ecological validity

Psychologists and Psychiatrists

- ▶ Psychologists have a post graduate degree in psychology and in many cases they have a PhD degree in psychology
- ▶ They have training in research methods, statistics and psychometrics in addition to their specific field of specialization such as educational, community, social, or organizational psychology etc.

- ▶ Most psychologists are not practicing professionals. Those psychologists who specialize in clinical psychology and counselling and have obtained a relevant degree to practice are involved in practice
- ▶ Clinical psychologists are different from psychiatrists.
- ▶ Psychiatrists are trained in medicine i.e., they are medical doctors or physicians
- ▶ Psychologists are not medical doctors. Psychiatrists have a MD degree in psychiatry

Basic and applied psychology

- ▶ Basic psychological research: Such research focuses on fundamental aspects and principles of behavioural processes
- ▶ Applied research: Related with practical implications and application of psychology in everyday life

- ▶ Basic research is related to seeking answers to new aspects and provides knowledge about fundamental questions. Such research leads to understanding of basic questions that may not be immediately applicable but basic principles may be very useful for research in applied areas
- ▶ Both basic and applied research and areas are interdependent and complementary

Ecological validity

- ▶ To what extent is a research valid in real life
- ▶ One question related to ecological validity is that can the research conducted on human behaviour in laboratory setting be generalized to real life
- ▶ Generalization of research results is an important issue in psychology
- ▶ Generally, if a study is conducted in real life setting it is likely that it will be ecologically valid

Questions

- ▶ What are some themes/debates in psychology?
- ▶ What is the nature vs. nurture debate?
- ▶ How can one explain the commonalities vs. differences theme?
- ▶ Provide the definition of automatic processing.
- ▶ Outline the debate regarding freewill vs. determinism.
- ▶ How are psychologists different from psychiatrists?
- ▶ Is there any interdependence between basic and applied research in psychology?
- ▶ What is ecological validity?

Thank you

Shikha Dixit

Professor of Psychology, Department of
Humanities & Social Sciences, Indian Institute of
Technology Kanpur, Kanpur- 208016, U.P., India

Email: shikha@iitk.ac.in



PSY151: Introduction to Psychology

Lecture 3: The Nature of Psychology

Areas of Psychology



Concepts covered in Lecture 2

- ▶ Themes/debates in psychology
- ▶ Nature vs. nurture, commonalities vs. differences, automatic vs. controlled processing of information, free will vs. determinism
- ▶ We also discussed some aspects of the work of psychologists
- ▶ Difference between psychologists and psychiatrists (partial overlap)
- ▶ Difference between basic and applied psychology (interdependence)
- ▶ Ecological validity



Subfields/ areas of Psychology

- ▶ Psychology covers a large range of human behaviours
- ▶ Work in diverse contexts such as understanding human cognition, educational processes and learning problems among children
- ▶ Psychology has many areas of study



Areas/ subfields of Psychology

- ▶ Clinical Psychology
- ▶ Counselling Psychology
- ▶ Developmental Psychology
- ▶ Educational Psychology and school Psychology
- ▶ Experimental Psychology
- ▶ Cognitive Psychology
- ▶ Community Psychology
- ▶ Social Psychology
- ▶ Health Psychology
- ▶ Industrial – Organizational (I/O) Psychology
- ▶ Positive Psychology
- ▶ Biopsychology
- ▶ Personality Psychology



Clinical Psychology

- ▶ Important field of psychology
- ▶ Clinical psychologists deal with mental disorders
- ▶ Specialize in diagnosis, causes and treatment
- ▶ Trained in assessment of emotional problems and psychotherapy
- ▶ Employ various types of psychotherapies and provide counselling to their clients



- ▶ Clinical psychologists work in mental hospitals
- ▶ Some work along with psychiatrists
- ▶ Clinical psychologists might also have private practice
- ▶ All clinical psychologists are not involved in practice
- ▶ Many of them are in academics. They teach and conduct research on clinical issues



Counselling Psychology

- ▶ Counselling psychologists provide counselling and therapy to people
- ▶ Counselling psychologists deal with psychological problems that are mild in nature
- ▶ Marital problems, family issues, career choice, vocational counselling, personality development, communication and social interaction issues etc.
- ▶ They use psychological testing for assessment



Developmental Psychology

- ▶ Developmental psychology studies how human beings develop
- ▶ Child development and also development over the entire life span
- ▶ Physical, intellectual and cognitive development, moral development, social development etc.



Educational Psychology and School Psychology

- ▶ Educational psychology is related to the study of all psychological aspects of the instructional and learning processes
- ▶ Educational psychologists also study the ways to enhance the learning and teaching contexts
- ▶ Educational psychology is a much larger field of study and deals with macro level issues. On the other hand school psychologists work directly with schools. Many of them work as school counsellors



Experimental Psychology

- ▶ Experimental psychology is a basic area of psychology. These psychologists are not directly concerned with application related aspects such as school, clinical or counselling psychologists
- ▶ They use the experimental method and controlled observation to study behavioural processes. They look for universal laws related to fundamental aspects of behaviour such as learning, perception, memory and other cognitive processes



Cognitive Psychology

- ▶ Cognitive psychologists use sophisticated and advanced experimental methods to study cognitive processes such as perception, memory, thinking, language etc.
- ▶ Cognitive psychology has emerged as a major area in the interdisciplinary field of cognitive science



Community Psychology

- ▶ Community psychologists study the problems of communities and the reciprocal relationship between individuals and community groups
- ▶ They generally use principles of clinical and social psychology to deal with community and social problems



- ▶ They deal with issues such as attitudes toward education and health in communities, relationships among subgroups in communities, health promotion, mental health issues in communities etc.
- ▶ Some community psychologists work as clinical psychologists, counsellors and mental health professional in communities. Many others work as social psychologists and provide solutions and counselling for social issues



Social Psychology

- ▶ Social psychologists study the individuals in the context of society. They study the beliefs, attitudes, thoughts, perception etc. of people in the actual or imagined presence of others
- ▶ Social psychologists study social and group behaviour, attribution process, person perception, attitudes and their measurement, stereotypes, prejudice, social influence, conformity among many other topics



- ▶ It sometimes appears that there is some overlap between sociology discipline and social psychology
- ▶ It is important to note that the focus of social psychology is individual in social context whereas the focus of sociology is social institutions in the society



Health Psychology

- ▶ Health psychology studies various behavioural and experiential processes related to the domains of health and illness that are psychological in nature
- ▶ Behaviours related to illness perception, prevention of disease conditions, treatment adherence, health promotion etc. are studied by health psychologists among many other aspects of illness experience



- ▶ Health psychologists study behaviours related to chronic conditions such as diabetes and life threatening illness experiences of cancer, HIV, heart disease etc.
- ▶ They also study gender and health, health related quality of life, health and illness related social cognitions, individual differences in responses to illness conditions and stress and coping in the context of illness



- ▶ Health psychology also draws from clinical psychology, social psychology, medical sociology and other applied areas of psychology
- ▶ In modern times with the increasing disease burden globally and issues of social inequality and stigma related to disease, health psychology has gained more importance



Industrial – Organizational (I/O) Psychology

- ▶ I/O psychology applies theories and principles from psychological research to understanding organizations and behaviour of people in organizational setting
- ▶ I/O Psychology is concerned about management functions, roles and skills. Behavioural processes are studied at three levels: Individual, group and organization



- ▶ I/O psychologists study behaviours related to teamwork, work motivation, employee performance, job satisfaction, leadership behaviour, employee satisfaction, organizational culture, organizational change, employee commitment, conflict within organizations, stress and work, work life balance, group structure, politics, ethics, and gender in organizational context



Positive Psychology

- ▶ Positive psychology emerged as a field of study that focuses on positive aspects of human life and living
- ▶ As a field of study, positive psychology is based on the philosophy that individuals have the capability to enhance themselves and lead a meaningful and fulfilling life
- ▶ Positive psychologists study and research on upon various topics such as happiness, hope, character strengths, optimism, increasing life satisfaction, well-being, gratitude, compassion toward others and self, self - growth etc.



Biopsychology

- ▶ Biopsychology focuses on the biological and physiological bases of behaviour. Biological aspects include brain processes, heredity and hormonal factors. These psychologists study how these biological factors influence various behavioural processes



Personality Psychology

- ▶ Personality psychologists study what is personality and how it is relevant for human behaviour
- ▶ These psychologists also develop tools for measurement of personality
- ▶ Personality psychology has applications relevant to various areas such as clinical, counselling, health, organizational behaviour etc.



To conclude

- ▶ We have discussed various subfields of psychology
- ▶ There are many other areas, such as environmental psychology, evolutionary psychology, forensic psychology, sports psychology etc
- ▶ The scope of modern psychology is very large and it is a fast growing field – the areas also keep expanding



Thank you



Shikha Dixit

Professor of Psychology, Department of
Humanities & Social Sciences, Indian Institute of
Technology Kanpur, Kanpur- 208016, U.P., India

Email: shikha@iitk.ac.in

Module 2

Approaches and History of

Psychology

**Lecture 1: Approaches to
study Psychology**

Approaches

- Approaches refer to broad ways of understanding behavior
- Approaches are the different perspectives to study behavior
- Some approaches have direct roots in schools of psychology

Major Approaches

- Behavioral
- Cognitive
- Psychoanalytic
- Humanistic
- Socio-cultural
- Biological

The Behavioral Approach

- Human behavior can only be studied in terms of observable stimuli and observable responses to stimuli
- Human mind cannot be studied and is not a valid subject matter of scientific psychology
- According to behaviorists, only those aspects of behavior can be studied through scientific psychology that are overt and amenable to measurement

Behavioral Approach contd...

- The behavioral perspective lays emphasis at the role of environment in determination of behavior
- Behaviourists studied and developed laws of learning and emphasized that human beings are a product of the learning experiences occurring in their environment
- John B. Watson, Ivan Pavlov and B. F. Skinner were noted behaviourists.

Behavioral Approach contd...

- Ivan Pavlov, one of the early behaviourists demonstrated that learning occurs due to association of events
- John B. Watson showed that environmental events or stimuli led to specific behaviours i.e., responses
- Criticism of behavioral approach

Cognitive Approach

- Cognitive processes such as attention, perception, memory and decision making etc. are important to human existence
- Focus on mental processes is important for understanding behavior
- Behavior cannot be understood only as mechanical chains of stimuli and responses

Cognitive Approach Contd...

- In 1950s, the study and research in cognitive processes started getting prominence
- Information processing approach provided a metaphor to psychologists for understanding mind as an information processing system
- As per cognitive perspective, behavioural aspects and human action cannot be understood without taking into account mental processes

Psychodynamic Approach

- According to the psychodynamic approach behavioral aspects are determined by the unconscious processes that are beyond our awareness
- Sigmund Freud's approach - major psychodynamic approach
- As per Freudian approach, anxiety, depression or other mental problems can arise due to painful experiences in early childhood that a person suffering from the problem cannot consciously remember

Psychodynamic Approach Contd...

- The terms psychodynamic and psychoanalytic both refer to Freudian approach. However, psychoanalytic approach refers specifically to Freud's theory
- Theorists other than Freud who made important contributions to the psychodynamic perspective are Carl Jung, Alfred Adler , Karen Horney, and Erik Erikson among others

Humanistic Approach

- Deterministic view of behavior (that behavior was determined by the factors beyond our control) was not acceptable to Humanists
- Humanists viewed human beings as masters of their own will and they emphasized the ideas of *free will* and *personal growth*
- Humanists such as Abraham Maslow and Carl Rogers believed that human beings have a striving to achieve their full potential

Humanistic Approach Contd...

- Maslow emphasizes *self – actualization*, which has been understood as the inherent capacity to realize one's potential fully and become an actualized and enhanced person
- Carl Rogers developed client centered therapy in which the therapist is a facilitator of the client's self growth. It is a non – directive form of therapy

Socio-cultural Perspective

- Human beings are socially situated. The social aspects and cultural contexts determine behavioral responses, conceptualization of reality, thoughts and cognitions
- The socio – cultural approach is concerned with the study of how behaviors and thoughts are impacted by the social and cultural aspects
- Psychologists study the differences determined by social norms and culture of different groups

Socio-cultural Perspective contd...

- Psychologists interested in culture study behavioural differences and similarities among people of different cultures
- Psychologists have questioned the view of behavioural similarity and invariance across cultures
- Both uniformity and variation in psychological processes and behaviours occurring due to socio-cultural factors are important and need to be studied

Biological Approach

- This approach is concerned about studying how brain and physiological processes and other bodily aspects influence behaviour
- This is a much advanced approach now and includes behavioural neuroscience and evolutionary psychology
- Psychologists using the biological approach study physiological aspects of behaviour through experimental method.

- After going through this lecture you should be able to articulate how different approaches study behaviour.
- In the next lecture (Lecture 2 of Module 2) we will begin the discussion on historical origin of psychology and the advent of scientific psychology

Thank You



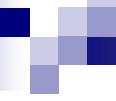
Shikha Dixit
Professor of Psychology,
Department of Humanities & Social Sciences,
Indian Institute of Technology Kanpur, Kanpur- 208016,
U.P., India
Email: shikha@iitk.ac.in



Module 2

Approaches and History of Psychology

Lecture 2: Historical Origins of Psychology



History of Psychology

- Focus: Schools of psychology
- Paths to modern psychology: Ancient philosophy, religion, physiology, physics
- Roots in philosophy: Most important antecedents to modern psychology
 - Not a scientific phase
 - Western philosophers

Roots in philosophy

- Several questions were investigated
 - ❖ How do we know?
 - ❖ Nature of the relationship between mind and body
 - ❖ Definition of mind (Changed several times); different implications for the function of mind and for the human being

Roots in philosophy

- Early Greek philosophers (Socrates, Plato, Aristotle)
- Middle ages (Descartes)
- British Empiricism (Hobbes, Locke, Berkeley, David Hume, James, Mill, James Stuart Mill)

Early Greeks

Specific contributions

- To recognize that mind and body differ in nature (Dualism)
- Nature of mind and body and their relation to each other (Dualistic position: separating mind and body)

Early Greeks

....contd.

- Suggested the notion of understanding the unknown by reducing it to its constituent parts
- Two methodological approaches:
Empirical and Rational
- Laws of association: Contiguity, Similarity and Contrast

Middle Ages

- General intellectual darkness
- Toward the end of the middle ages a few thinkers questioned the dogma (15th and 16th century)
- French philosopher and mathematician Descartes stands in direct relationship to the history of modern psychology

Middle Ages

....contd.

■ Descartes

- Dualist (interactionist)
- Accurate descriptions of nervous system
- Path of nervous impulses

From Descartes onwards rapid development of science

Emergence of psychology: British philosophy and physiology

British Empiricism

- Dealt with problems that have a bearing on methodology and orientation
- Scientific phase not yet in
- The term psychology was used but not independently from philosophy
- Empiricism places the origin of mind in sensation

Empiricism contd...

- Higher mental processes – complexes of persistent impressions held together by associations
- Associations due to certain conditions present at the time of sensory impressions (repetition, contiguity)
- Notion of *tabula rasa* (blank tablet)

Empiricism

... contd.

- Greeks: Questions about nature of mind
Empirical – associationistic tradition:
answers in elementalism and
associationism
- An experimental/ observational approach
was now required to explore these issues
(paved the way for scientific psychology)

Empiricism

To summarize –

- Primary material of mind – sensations
- Mind can be reduced to its elements by analysis
- John Stuart Mill: Ideas generated from elements are not merely the sum total of individual parts (Gestalt psychology)

Scientific Psychology

- Psychology became empirical
- Unique contributions by Weber, Fechner, Helmholtz and Wundt
- Wundt: Founder of Psychology as a formal academic discipline. Established the first experimental lab in Leipzig, Germany in 1879
- Wundt: Leader of the first school of psychology



Thank you

Shikha Dixit

Professor of Psychology,

Department of Humanities & Social Sciences,

Indian Institute of Technology Kanpur,

Kanpur, 208016, U.P., India

Email: shikha@iitk.ac.in

Module 2: Approaches and History of Psychology

Lecture 3: Schools of Psychology

Schools of Psychology

- Wundt: First laboratory of Psychology in Leipzig, Germany in 1879; Leader of the first school of psychology (Structuralism)
- Migration to Leipzig
- Psychology grew either from the Leipzig lab or as different schools of thought outside Germany
- For several decades (1900 to 1930 approx.) psychology took shape through schools

Schools of Psychology

- Structuralism
- Functionalism
- Behaviorism
- Gestalt Psychology
- Psycho - analysis

Structuralism

- Wilhelm Wundt, Edward Bradford Titchener
- Wundt: Experience as the subject matter of psychology (experience dependent on an experiencing person)
- Structure of mind (analysis should be applied to psychological phenomena)

Structuralism contd...

- Structure of the mind
- An attempt to compartmentalize the mind into its basic parts – mental elements (sensations)
- Introspection: Trained observers objectively examined and verbally reported what was going on in their minds in response to controlled stimulation; objective attitude

Structuralism contd...

- Criticisms of structuralism due to reliance on introspection
- Not verifiable, retrospection and memory distortions, subjective, influence of observer's attitude, considerable laboratory training
- How to study conscious processes of children and mentally disturbed individuals?

Structuralism contd...

- Reliance on introspection as its main method led to criticism of structuralism
- Introspection as a limited method
- Failure to relate mind and action
- Narrow in approach

Functionalism

- American psychologist William James (psychologist, pragmatic philosophy)
- The study of mind as it functions in adapting the organism to its environment
- Functionalists were influenced by Charles Darwin's approach
- Opposed the reduction of mind to its components

Functionalism contd...

- Emphasized studying consciousness as an ongoing process (stream of consciousness)
- Mind as functional in adjustment - not a static entity
- Structuralism: What the mind is made of?
Functionalism: How it functions?
- Connection between mind and behavior
- Learning as adaptive process
- Regarded introspection as a limited method

Behaviorism

- Against structuralism and functionalism
- Main proponent: American psychologist Watson (began his career in psychology at Chicago University)
- Pavlov, Skinner, Thorndike
- Opposed introspection --- emphasized objective experimental procedures

Behaviorism contd...

- No place for mental or cognitive concepts
- Subjective mental states cannot be the subject matter of psychology
- Major emphasis: Study of observable behavior such as actions, responses, performances
- Goal of psychology: To identify S-R relations

Behaviorism contd...

- Environmental influences as all important
- Major contribution to theory of learning
- Pavlov in Russia provided an interesting demonstration of the use of S-R analysis in his description of classical conditioning
- All behavior, no matter how complex, can be reduced to learned S-R units - Watson

Gestalt Psychology contd...

- Emphasis on whole, rather than parts
- Basic principle: The whole is more than the sum of its parts
- Gestalt psychology - theory of perception; principles are applicable to other domains
- Rejected the S-R approach
- Emphasized experimentation and observation

Psycho-analysis

- Synonymous with the name of Sigmund Freud
- Complex ideas about human personality and behavior
- Work on hysteria and clinical practice
- The unconscious, structure of personality, defense mechanisms, psycho-sexual stages of development

Psycho-analysis

- Unconscious mind consists of emotions, motivations, thoughts, and memories that are beyond conscious awareness
- Ego defense mechanisms - psychological strategies that are used unconsciously; protect from anxiety and conflicts
- According to Freud, psychological development in childhood occurs through psychosexual stages of development

- Structure of Personality: Id, Ego, Super-ego
- Id – Unconscious – Basic impulses such as sex and aggression, seeks immediate gratification, pleasure principle
- Super Ego – Mostly preconscious - Ideals and sense of morality, internalized from parents and society
- Ego – Mostly conscious, mediates between id impulses and moral principles and inhibitions of super ego, reality principle

Thank you

Introduction to Psychology
Prof. Braj Bhushan
Department of Humanities and Social Sciences
Indian Institute of Technology, Kanpur

Lecture - 05
Perception
Sensory Mechanisms

So, welcome to this first lecture. Initially, before I take you into the details of some of the topics which might be very interesting to you from behavioral point of view.

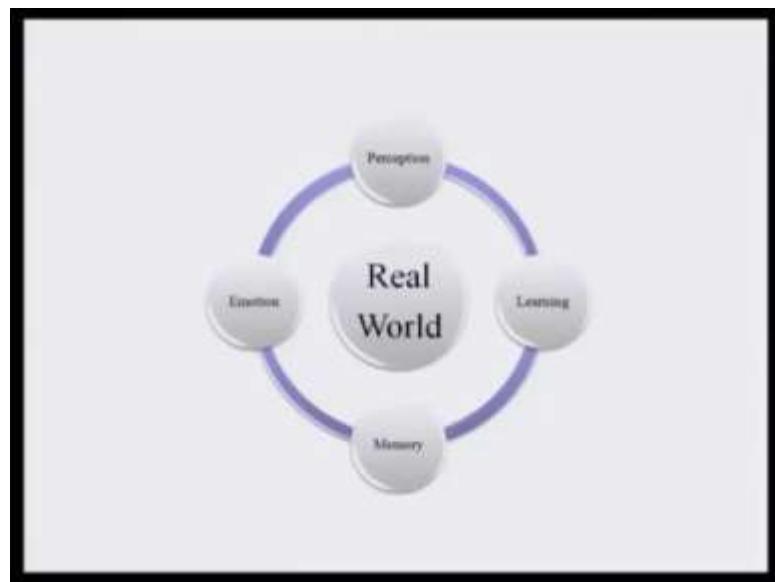
(Refer Slide Time: 00:32)



Just look at the line that you see on the screen. What do you see right now, you somehow guess that this is perhaps a curve line that someone has drawn, I extend it little more and then you realize that fine the line has now taken more sharp turn towards the right and then I further try to extend it. It is difficult to make a sense out of it and then I add these lines and you can very easily now make out who this person. This is the image that gets generated in your mind.

When this image gets generated in your mind, suddenly you recollect not only the name, but you recollect whole sequence of events attached to this very individual who is known as the father of the nation. You have derived certain type of a mental images of a certain type of representations like, freedom you derive you might even derive the political map of a country called India you might have recollection of philosophy that is now called as Gandhian philosophy whole lot of things gets recollected.

(Refer Slide Time: 01:48)

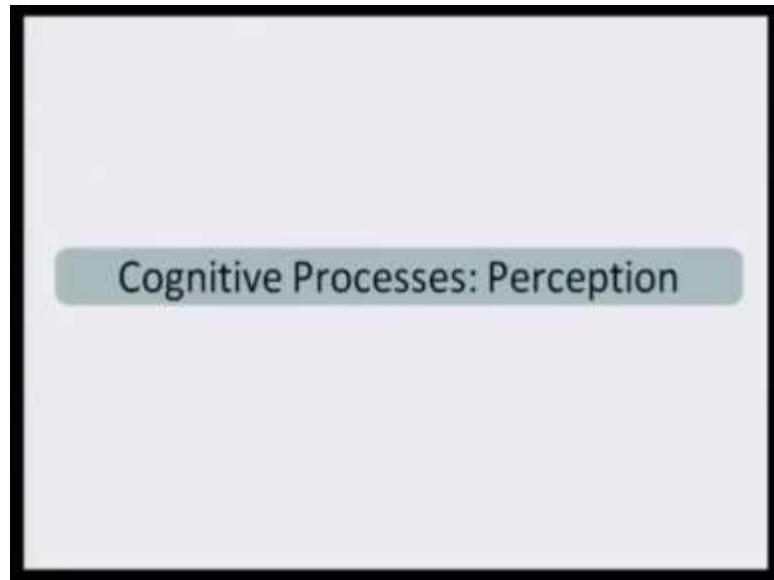


So, actually when you look at the real world we take certain inputs from the external environment. Sometimes it might be that might draw some inputs even from our internal mechanism and then we try to assign a meaning to it. In psychology this is what we call as Process of Perception. Now the fact that I fail to decipher the line even though it was being extended couple of times till I got substantial cue to identify that I am looking at the line drawing that represents the Father of the Nation. I was searching for a possible cue so that I could assign a meaning to it this process is what is called as Perception.

So, when you see these things or when you saw the line that you saw right now to derive an image of what you are looking at you have learned certain things certain things got recollected from your memory and then it did induce a sense of feeling within you. So, initially we will begin with the process of perception, then will go to learning, then will

come to memory and finally, we will be talking about emotional process the affective process.

(Refer Slide Time: 03:05)



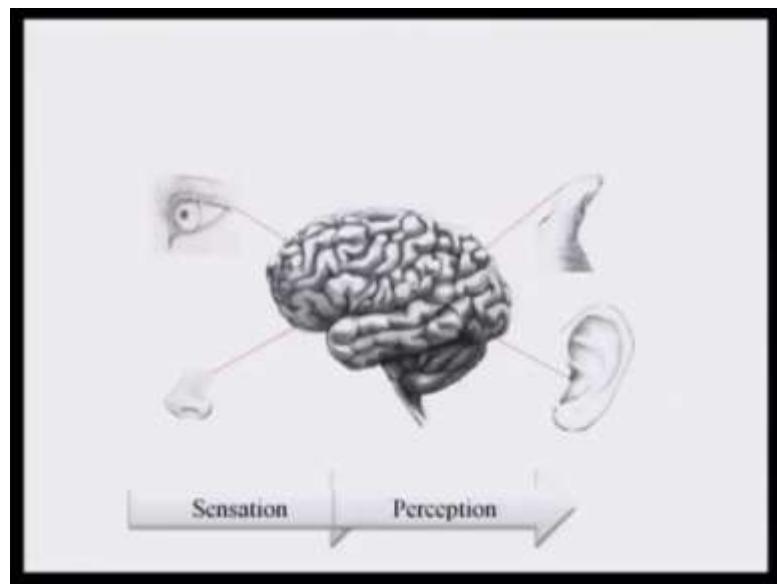
Before we come to perception let us understand one thing, that the brain before it arrives at a conclusion before it assigns a meaning to something it would require a trigger, it would require a sensation from outside.

(Refer Slide Time: 03:38)

- Internal/ external stimuli evoke responses.
- Stimuli stimulate the sense organs.
- The brain processes signals received from these sense organs.
- Thereafter, we assign meaning to these sensations.

So, any information that comes to brain whether it is through the any external source or it is through the internal source this is called Sensation. And as you know that we are endowed with certain sensory organs. So, these sensory organs whether it is eyes, ears somesthetic sensors tongue all these sensors, they send certain type of stimuli to the brain. So, the internal or the external stimuli that evoke response in us, is always important for a perceptual process to begin. So, when the brain will start processing the signals that it receives from the environment, it will then suddenly go ahead with process of assigning meaning to it.

(Refer Slide Time: 04:10)



So, any perceptual process that we are looking at from the point of view of sensory input coming through sense modalities will finally, look for a possible meaning that would be considered as the most appropriate representation of what the brain is finally, decide for. And this is what is called Perception.

What we will do as part of this very course is that initially our focus would be on the process of sensation. So, we would look at the basic sensory organs, the eyes, the nose, the ears, the somesthetic sensors, the kinesthetic sensors, the vestibular sensors, the olfactory mechanism and then we would know try to get a feel that this is how the brain gets the information and this is how we understand what is there in the real world.

(Refer Slide Time: 05:04)



For doing this I am taking this very example, here you see boy who is primarily playing in the park. This boy is primarily trying to aim at the color disk that he is looking at. Suddenly he finds a bird there and he starts following the bird because the chirping sound attracts him. If he is hungry, then he removes the rapper and eats a chocolate and then suddenly while eating he sees a rose in one of the corners of the park and he goes and smells it. These are the processes that all of us experienced throughout our life.

(Refer Slide Time: 05:49)

Transduction

- Physical energy of the stimuli are converted into impulses for transmission to the brain.
- This process is called transduction.

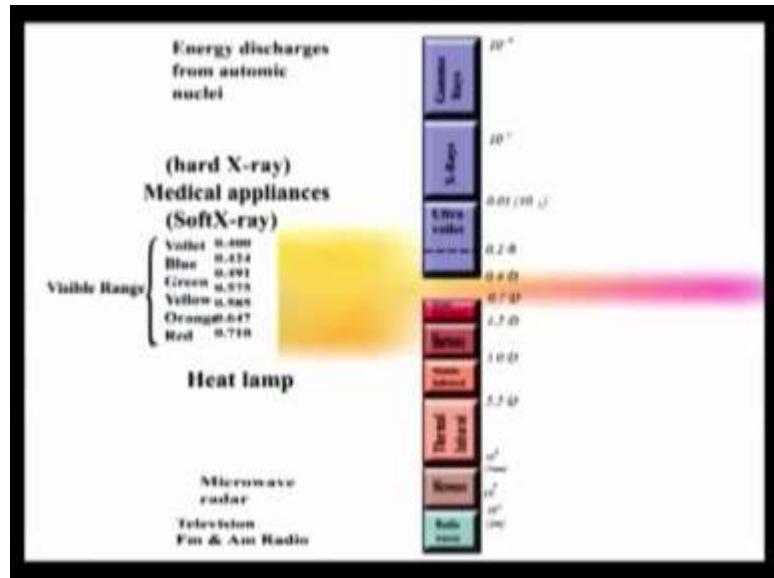
So, when the physical energy of the stimuli, when it is gets converted into the impulse and get transmitted to the brain. So, that the brain can finally, make a meaning out of it, this is called as Process of Transduction. So, the physical energy getting converted into an impulse which the brain can process is the process of transduction and this transduction is we can consider as the first step towards perceiving the external world.

(Refer Slide Time: 06:22)

- Human beings have five important senses:
 - Vision
 - Hearing
 - Taste
 - Smell
 - Touch
- In addition to touch, the skin contains senses for heat, cold, pain & pressure.

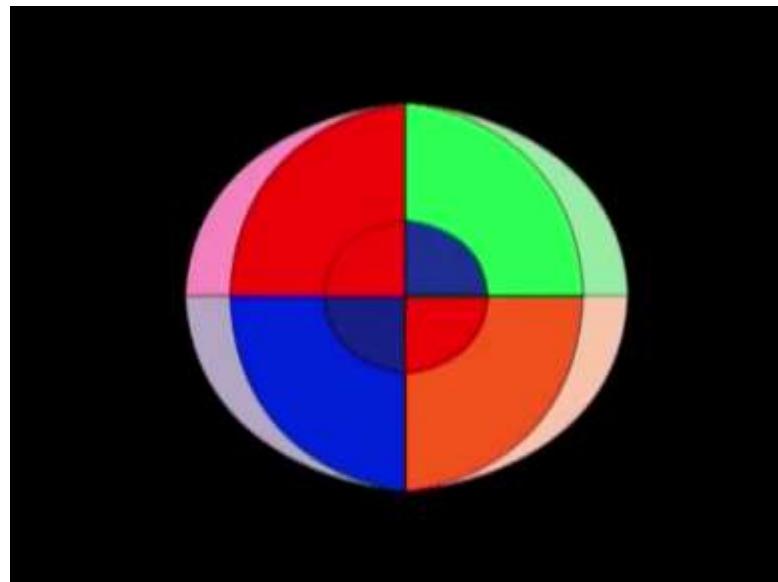
So, we have as human beings five important sense organs. A Vision, Hearing, Taste, Smell and Touch and in addition to touch the skin also now provides you with the senses of heat cold pain and pressure.

(Refer Slide Time: 06:41)



Now look at this very video. Let us now understand that fine once we know that this is what our eyes can process, how does the visual system works. To comprehend the visual mechanism clearly let us look at this video, here you see the electromagnetic variations emitted by various objects as you already know the visual spectrum extends from about 380 to 780 nanometers. The colors represent the visible spectrum.

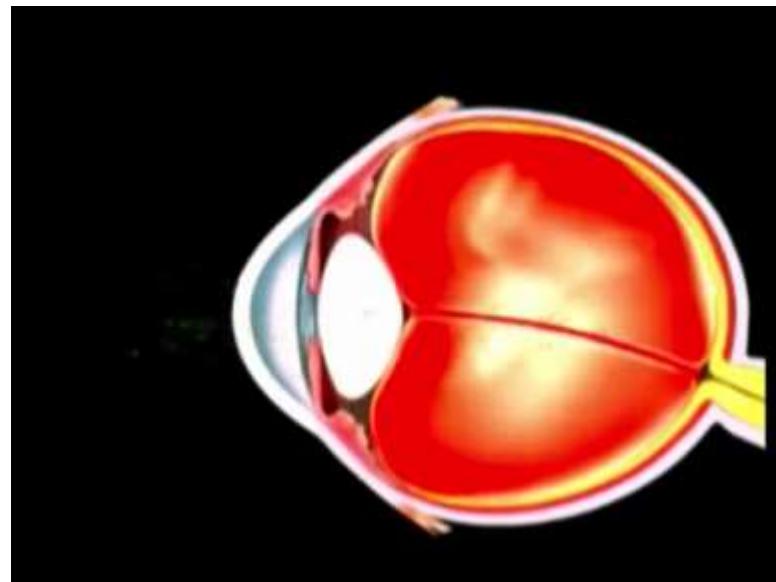
(Refer Slide Time: 07:15)



(Refer Slide Time: 07:21)



(Refer Slide Time: 07:27)



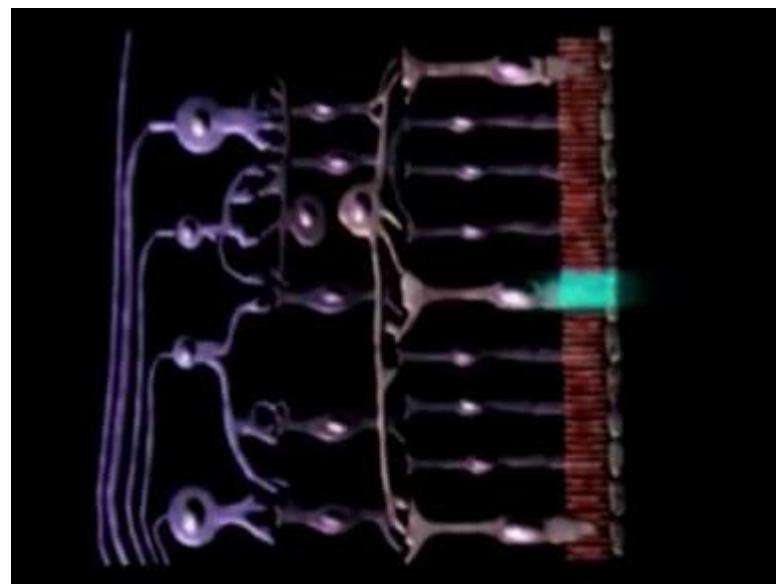
This is a colored disk and this boy is aiming at it we are trying to understand the visual mechanism. So, what did he see, to comprehend this let us look into his eyes, the light from the colored disk entered the eye through Pupil, Cornea, Lens and Interiors of eye ball it has now reached the Retina.

(Refer Slide Time: 07:55)



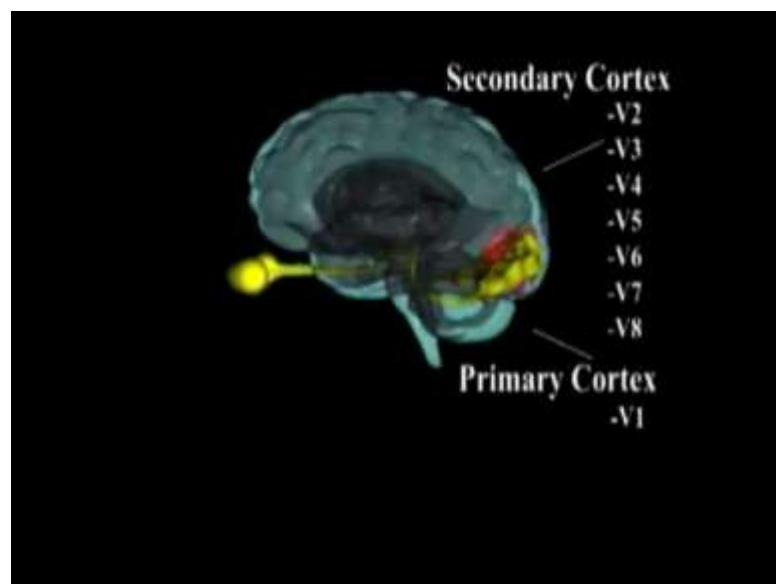
What you see now is a photo micrograph of the rod and cone sense in the eyes.

(Refer Slide Time: 08:04)



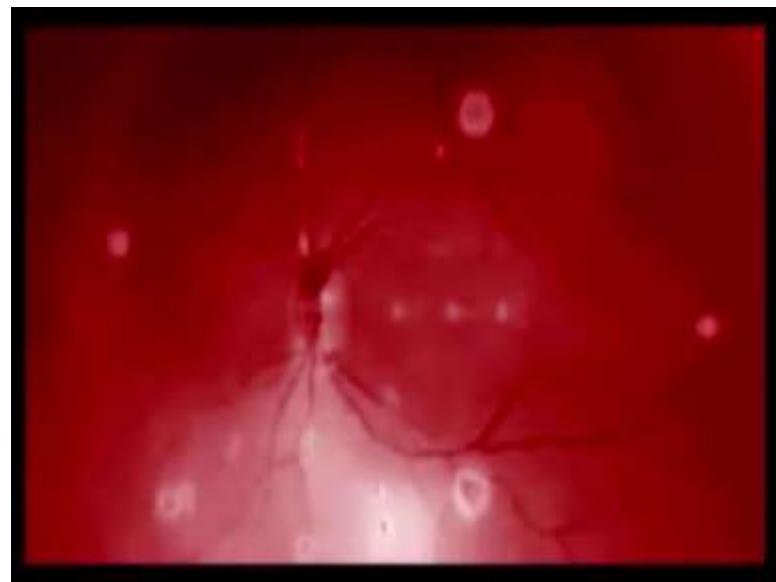
You are now looking at the ganglion cells that is M and P cells and the bipolar neurons. The light passes between the ganglion cells and the bipolar neurons. The bipolar neurons send the signal back to the ganglion cells. There after the optic nerve carries the signal to visual cortex.

(Refer Slide Time: 08:27)

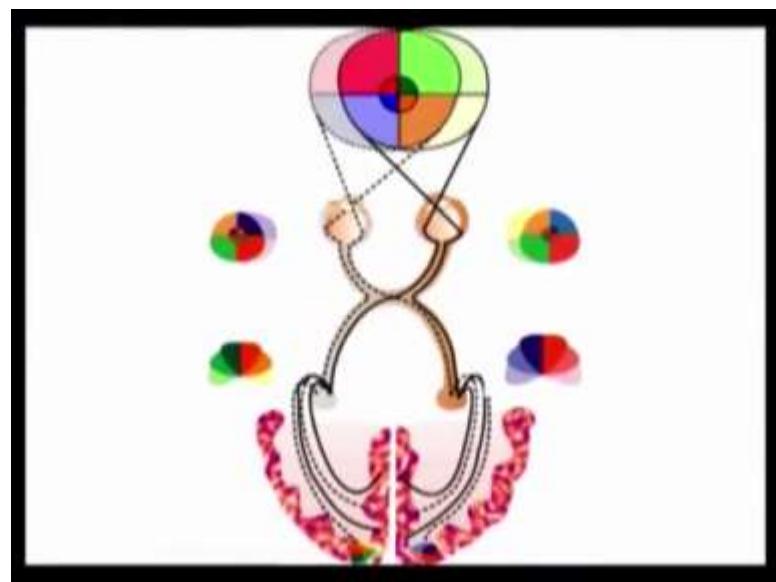


You now see the primary and the secondary visual cortex. That is visual area 1 mentioned here as V1 and areas 2, 3, 4, 5, 6, 7 and 8.

(Refer Slide Time: 08:42)



(Refer Slide Time: 08:46)



Here you see the optic disc fovea and blood vessel. The visual sensation in this boy completed now, he was aiming at the colored disk. So, what did his brain see? The

extension of the color disk that you see with dashes shows the visual field of left and right eyes respectively. The part of the colored disk that you see next to the eye balls show the respective projections on the Retina of the left and the right eyes. The bright yellow light represents movement of signal across the brain. Some of optic nerves from both the eyes cross to other side of the brain at optic chiasm.

The neural conduction in the optic nerve reaches the lateral geniculate nuclei. The spread of colors on the left and the right sides show the inputs to the left and the right lateral geniculate nucleus respectively. Finally, the input reaches the visual cortex. Once again the colors, that you see in the part of the cortex represent the input that has reach the primary visual cortex on the middle surfaces of the left and right hemispheres of the brain. It is worth looking, that the full colored disk that the boy was looking at has been preceded differently by the two eyes and of course, two hemispheres of the brain. What is remarkable is that the parts of this information finally, combine and we perceive it as a color disk.

(Refer Slide Time: 10:10)

Vision

- The convex lens of the eye makes an inverted image fall on the retina.
- The shape of lens changes in order to bring light from near objects to a sharp focus on retina. This process is called accommodation.

Now, primarily what is important for us to understand here is, that the convex lens of our eyes, it makes an inverted image fall on the Retina and the shape of the lens changes in order to bring light from near objects to a sharp focus on the Retina and this very process

of bringing sharp focus on the Retina is what is called as Accommodation. So, what we have done we have talked about transduction, we have right now talked about accommodation.

(Refer Slide Time: 10:41)

Retina

- Retina is the light-sensitive layer at the back of the eyeball which contains two types of photoreceptors- RODS & CONES.
- Human retina contains about 120 million rods & 6 million cones.
- It is obvious that numerically it is actually rod-dominated.

Now, the Retina is a light sensitive layer at the back of our eye balls which contains two types of photo receptors the rod cells and the cone cells. And it is very interesting to understand that numerically our Retina is rod dominated.

(Refer Slide Time: 11:00)

Vision

- OPTIC NERVE carries visual information from retina to the brain.
- BLIND SPOT is the point of exit of optic nerve. It has no photoreceptors.
- Visual acuity is maximum at fovea, and is graded from the fovea out towards edge of the retina.

Then the primary things that you saw in the video right now over the optic nerves which carries the visual information from Retina to the brain and the point where the optic nerve makes an exit from the eye is called the Blinds Spot, because it does not have any photo receptors.

(Refer Slide Time: 11:17)

Transduction in Vision

- The rod & cone cells contain photosensitive pigments.
- Rhodopsin is the pigment present in rod cells. It exists in the cis-rhodopsin configuration when not excited.
- Excitation by light makes it to change to trans-rhodopsin configuration.

Now the rod and the cone cells they contain photosensitive pigments and very interestingly the rod cells for example, when it is not excited it is in the cis-rhodopsin configuration and when the light falls on it, it changes into the trans-rhodopsin configuration and this concept we will again carry when we come to memory and when we would be talking about iconic memory.

There we would be saying that right at the level of this sensory organ certain amount of time, very brief period of time, some amount of information is retained and at that time we would be referring to iconic memory, but right now we are not going to memory, but I would just request you to remember this fact. That the chemical configuration changes and to have a second round of excitation this trans-rhodopsin configuration will have to return back to it is a cis-configuration state.

(Refer Slide Time: 12:17)

Characteristics of Rod & Cone Cells		
Characteristics	Rod	Cones
Number	Approx. 120 million	Approx. 8 million
Response	Light and dark	Light, dark & colours
Sensitivity to light	More sensitive than cones	Less sensitive than rods
Dark adaptation time	30 minutes (Approx.)	10 minutes (Approx.)
Light adaptation time	About 1 minute	

Now, let us just compare the characteristics of the rod and the cone cells in terms of number of course, as I said that our Retina is rod dominated. So, we have a approximately 120 million rod cells compare to just 8 million of cone cells, in terms of response rod cells are of course suppose to process the light in the dark condition whereas, cone cells also have the responsibility of identifying the colors. They are sensitive to colors. In terms of sensitivity to light rod cells of course, are more sensitive

compared to the cone cells. If you experience a dark situation, in terms of dark adaptation time the rod cell it takes approximately 30 minutes to adapt whereas, the cone cells they take approximately 10 minutes to adapt, where is in the light condition both these cells they take approximately 1 minute for adaptation.

(Refer Slide Time: 13:14)

Characteristics of Rod & Cone Cells		
Characteristics	Rod	Cones
Optimum Operation	Night, darkness	Day, bright light
Location	Most dense just outside the fovea	Throughout retina; Most dense in fovea
Neural Connection to Bipolar Neurons	Pooled connection	One-to-one connection

And again now the optimum operation of the rods cells can be seen during darkness whereas, cone cells maximum operations can be seen during bright light. And in terms of its location on the Retina the rod cells are more dense just outside the fovea whereas, cone cells are you know distributed throughout the Retina and it is more dense on the fovea, and in terms of neural connection to the bipolar neurons that you saw in the video, the rod cells are they are into pooled connected form format whereas, the cone cells they are one to one connected.

(Refer Slide Time: 13:53)

Audition

- As we saw importance of visible spectrum in the case of visual sensation, similarly we have limitations with respect to our audible range.

Now, in the video that you saw for the visual mechanism; you realized that we have a limitation in terms of our visible spectrum, it's not that entire range of light can be seen by us. So is the limitation even with our auditory mechanism.

(Refer Slide Time: 14:12)



Look at this very video, to comprehend the auditory mechanism let us look at this video. This young boy is fascinated to the chirping sound of the little bird; he is scrolling and approaching the bird. How does he here this sound.

Look at his pinna, his pinna collects the sound energy that is generated by the bird. This sound travels through the ear canal and strikes his tympanic membrane. That is his ear drum. Here sound energy is transformed into mechanical energy, the oscillation of the ear drum makes the malleus ,incus, and stapes move. Besides transmitting the energy, these bones also amplify the sound. You can see the oscillation of stapes in the middle ear.

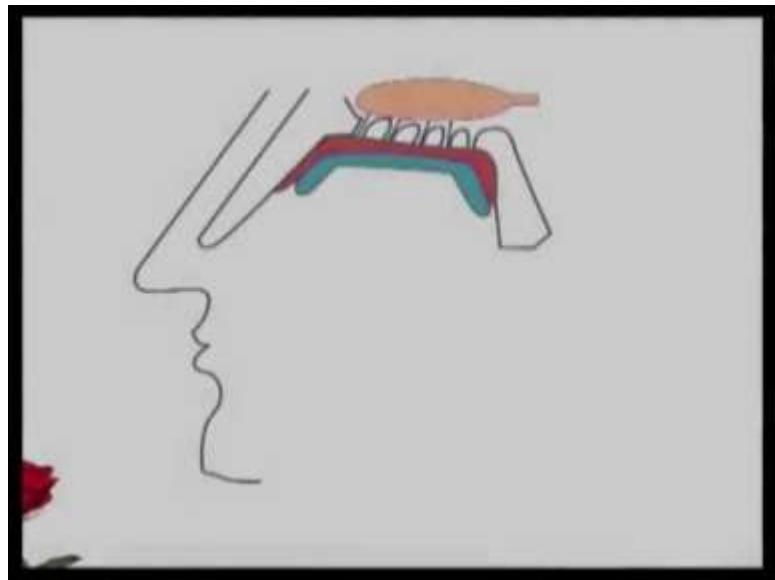
(Refer Slide Time: 15:14)



This now presses the oval window and the vibration enter cochlea. You now see the organ of corti. The wave in the cochlea has reached there; the organ of corti has numerous hair cells, which act as receptors. The pressure on the waves stimulates these hair cells which in turn generates receptor potential. This neural firing travels to the brain through auditory pathway and the child senses that he is listening to this melodious sound of the bird.

Having seen how this child was actually listening to the chirping sound of the bird. Let us now come to the mechanism of Olfaction. This boy now after chasing the bird goes to a corner of the park looks at the flower. Look at this very video.

(Refer Slide Time: 16:00)



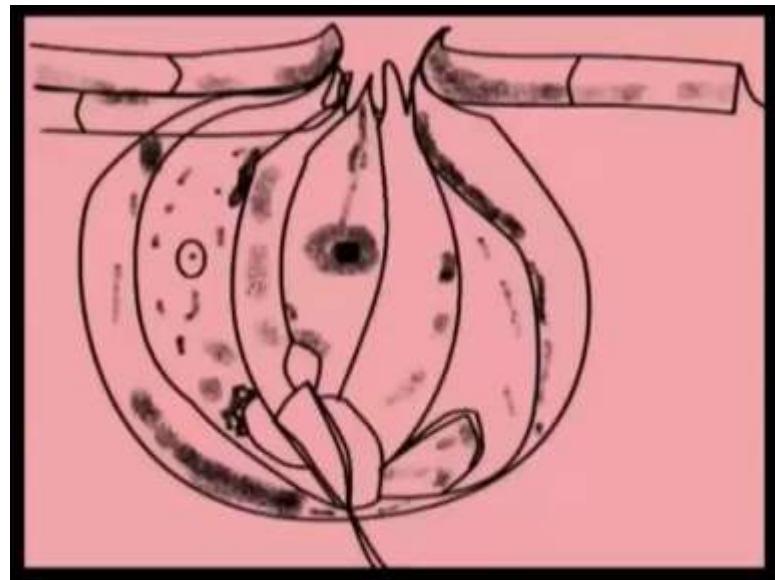
Let us look at this video to understand the olfactory mechanism. This young little boy is too fond of roses, he goes and sniffs the rose in his garden. How does he identify the smell of the rose? As you see here, the vigorous intake of air by this boy has made the OBP release in his nose. The receptors at the olfactory epithelium specialize in a particular smell, this unique odour reaches his olfactory bulb.

You see the olfactory bulb olfactory nerve and the mitral cells. You now see the olfactory receptor neurons that are blue, green and red in color here. You can see the OBP released and the conduction of odour signal in the olfactory receptor neurons. These odour signals are now transmitted from olfactory neuron to the mitral cells and finally, the olfactory track carries the message to the brain. This is how this young boy got this smell of the rose.

Now, after having had the smell of the flower now the boy feels hungry and he thinks of eating chocolate, look at this very video which would explain the mechanism of taste.

This young boy is enjoying a chocolate, how does he get the taste of it, look at his tongue.

(Refer Slide Time: 17:27)



The tip of the tongue sensitive to sweet and salty taste; side to sour and the back to bitterness you can see small bumps that contain the taste buds, these bumps are called Papillae. You can see a taste bud. The chemical components of chocolate dissolve in the saliva and goes down to the services between the papillae. This chemical interaction triggers adjacent neurons and these impulses travel to the parietal lobe and limbic system of the brain of this boy. This is how he got the taste of the chocolate.

(Refer Slide Time: 18:07)

Taste

- Sensitivity of the tongue:
 - Tip- Sweet & Salty
 - Back- Bitterness
 - Sides- Sour

Now, if you combine all the video that you seen, you saw the video for the visual mechanism, you saw the video for auditory mechanism, you saw the video for the olfactory mechanism and finally, the taste mechanism. So, if you combine all these now video that you saw right now.

(Refer Slide Time: 18:27)

Sensation

- We have discussed five basic senses till now.
- The visual & auditory systems are exteroceptive systems since they are sensitive to external stimuli.
- The somatosensory system also has an exteroceptive function.

You can very easily sense that fine this is how we make a sense of world. So, till now we have discussed the five basic sense modalities. The visual and auditory systems are exteroceptive systems. Since, they are sensitive to our external stimuli, whereas somatosensory system also has an exteroceptive function to perform.

(Refer Slide Time: 18:48)

Sensation

- Beside these five senses, Kinesthesia & Vestibular senses are also of importance.

So, beside these five senses, we have two important sensations one is the kinesthesia senses another is the vestibular senses and both of them help us like anything in terms of living in this very world.

(Refer Slide Time: 19:04)

Sensation

- Kinesthesia is the feeling of motion of the body parts involved in some form of movement.

Now, Kinesthesia is the feeling of motion of the body parts involved in some form of movement. Imagine the situation say for instance, you are traveling you are walking, you are running. Now basically what you are doing is that you have perception of your body parts, how it moves and that gives you a constant feed back in terms of synchronizing your movement, so that you can perform the act that you are performing. Whether it is say walking running whatever it is. It is this very kinesthesia sense which gives you a complete feedback as to how your body parts are moving and this helps you a perform the task meticulously.

(Refer Slide Time: 19:54)

Sensation

- The vestibular senses are responsible for making us have the sense of spatial orientation
 - to know the position of our body in the space, and
 - sense of balance- getting information about the relative position of related body parts during movement.

The other sense that we are now coming to is the sense what is called as the Vestibular senses and these are senses which are responsible for making us have the sense of spatial orientation. spatial orientation would mean that it helps us know, the position of our body in this space. Say for example, if you are say - trying to jump for instance. You have to understand very well the relative position of your body in the space.

So, the sense of balance during movement all types of movement is basically dependent on the vestibular senses.

(Refer Slide Time: 20:41)



Let us now see these small video clips from the Beijing Olympics. These are some of the finest movements, that human beings are capable of performing. All this require extreme degree of coordination. Now that the video footage that you saw, you had a gymnast who was moving without looking at object that hand was resting the body weight upon. In the other case you saw an athlete performing on the surface of the ice and it was a perfectly synchronized movement even though the body weight was rested on 1 foot, 2 foot both the feet and then even while the whole body was you know swinging very fast.

Now these are the processes for which you require sound vestibular mechanism. So, with this we come an end to our discussion on the first topic, where we focused exclusively on the sensory mechanism. Just to recapitulate we have discussed about the visual mechanism, we have talked about the auditory mechanism, we talked about olfactory mechanism, we also talked about the taste mechanism, these four mechanisms and then we additionally we took into account the kinesthetic and vestibular senses. So, this is how the input comes to the brain. Once this following the process of transduction the information comes to the brain, our brain then tries to assign an appropriate meaning to this. If we succeed a assigning an appropriate meaning to what we have sensed this is what is called as Perception.

Key words - perception, transduction, vision ,audition, taste , sensory mechanisms

Introduction to Psychology
Prof. Braj Bhushan
Department of Humanities and Social Sciences
Indian Institute of Technology, Kanpur

Lecture - 06
Perception
External Factors in Perception

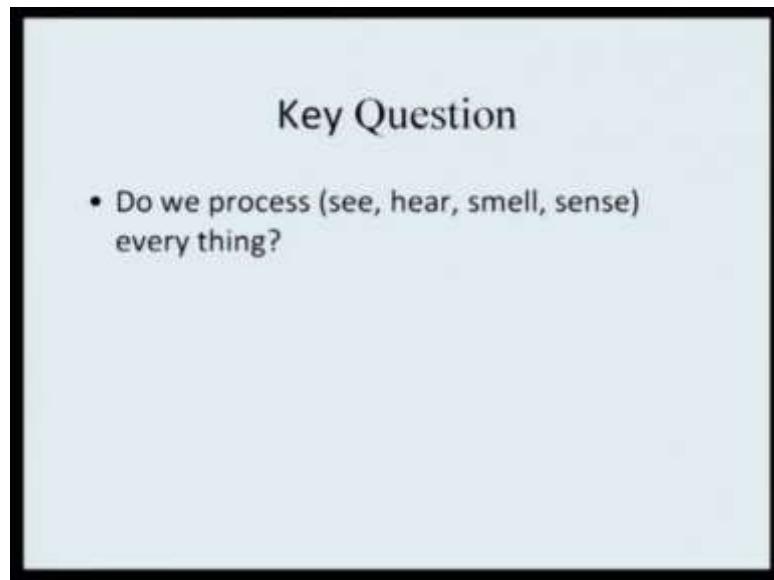
We will now continue our discussion from this very process of Sensation. What we done till now, that we just saw how these sense modalities they acquire the information, external information from the world and then how the signal gets processed in the brain, and then we discussed that well, we all try to assign the meaning to what we have seen and depending on the meaning that we assign to the object that we have perceived, we are seen in fact, not even perceived, we try to you know look at the appropriateness of that meaning. If we are able to give an appropriate meaning, fine perception is taken place, sometimes we do commit error while during that. So, in the process obsession nothing went wrong, but while assigning meaning we do commit an error and that is when we say that illusion has taken place.

We will little later, we will also come to illusion, but right now I will now going to little more detail of the perception phenomena, but before that although I do not want you to go into detail of it, I would just like you to very quickly look at the screen and you see this is the major connection of the visual system. When you look at the major connections ultimately you realized that it is the tertiary and the Paralympic system of the brain which gets activated at the end.

And remember these are the areas of the brain which has to do with emotions. Similarly, if you look at the major connections of the auditory system, right from the process at the level of inner ear, where the nerve starts conducting the information; you realized it finally; once again the sensory mechanism in terms of it is neural under pining goes up to the tertiary in the Paralympic area in terms of order recognition. In terms of smell again we see that the limits gets in the picture and if you look at the test mechanism once again the later life, hypothalamus and amygdala gets into action. What primarily you see here again for even find touch pressure in (Refer Time: 02:34) that. Once again tertiary in the Paralympic area gets activated.

What is important to realize here is that every time, whenever we have this process of sensation taking place and the brain trying to assign meaning to what we have sensed, the areas of the brain which are actually supposed to take care of the emotional aspect that gets activated.

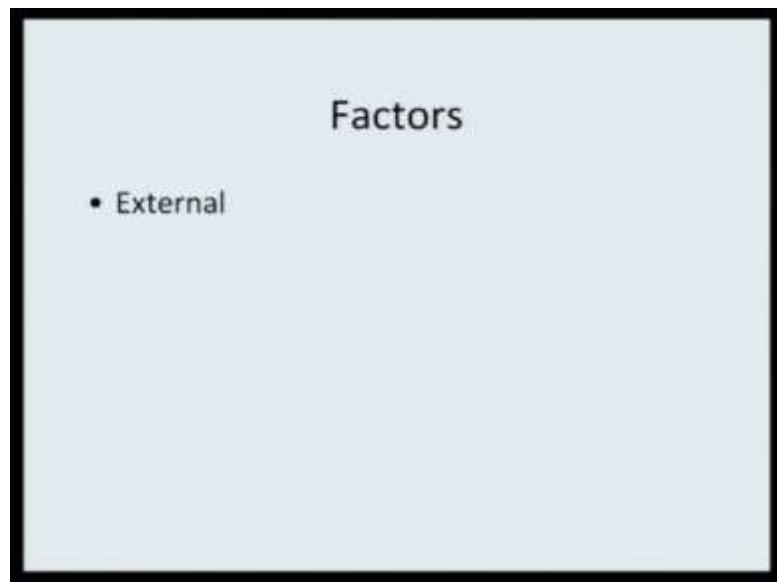
(Refer Slide Time: 02:59)



So, whenever we sense from the external world, the process of perception is not what you call free from emotion. So, the moment we try to assign the meaning, remember last time we had discussed in the previous lecture that right at the level of sense modality, we can store the information for very very brief period of time and I told you that remember this whenever we come to our discussion on memory at that time once again we will talk about sensory memory and this was with the reference of iconic memory.

So, memory gets activated there now we are saying that fine, emotion also gets activated now that we have to understand. Now sensation is conducted in the brain how the brain assigns meaning to it the key question is that is it that we processing each and everything that comes to us ? So, do we see everything that is available in the visual spectrum, do we hear everything in the environment, do we smell everything do we sense everything. So, on what ground does the brain decide, that this has to be processed and this has not to be?

(Refer Slide Time: 04:27)



Now there are many things, with respect to perception. I am in a particular type of environment. There are external stimuli around me, which comes to my brain through my sense modality and at the same time I am at a particular type of a position in the given environment. So, the perspective that might particular sense of modality will take, for example, if I am looking at the camera right now, the perspective of the object which is available in my visual field. Other type of external stimuli and at the same time my own decision to act the way I want to at that point in time in environment.

So, there are many many factors that will now come into picture. What we are doing right now for the purpose of understanding the perception process, what we are doing that in this very lecture we would be talking more about those external factors that has to do with the strength of the signal. So, we are looking at the external factors right now, we are not looking at the other aspects, other aspects we come in the coming days. Now the most important thing when it comes to the external factors is the concept called Threshold or Limen.

(Refer Slide Time: 05:49)

Limen

- Absolute limen: Minimum intensity of stimulus that can be detected 50% of the times .
- Difference limen: Smallest difference between two stimuli that can be detected.
- Terminal limen: Threshold at which original sensation changes to another one.

Three terms are to be remembered here, the absolute limen, the difference limen and the terminal limen. Now absolute limen means that this is the minimum intensity of the stimuli that you can detect a minimum 50 percent of the time. So, whenever you have absence and the presence of the stimuli you should be able to detect it half of the time.

Now, difference limen is basically nothing, but it is the smallest difference between two stimuli, that you can detect and then comes the terminal limen where you realized at the threshold changes to the extent that you do not consider the sensation. The perception to be exactly what you thought it initially was the measure of the sensation changes. Now let us understand this with an example you just know on your computer monitor where you or watching this lecture right now, Just minimize the volume make it come to zero and now you start increasing it, slide the slider now and then you realize it although physically the value changes it says 0 1 2 3 4 5 6 likewise no you get a indicator which tells you that the sound quality has changed which has increased, but somehow you are not able to listen to it.

So, the first case when it was 0 there was complete absence of this auditory signal. You can do it, do the same in the visual signal to turn your screen black and then you gradually you start know adding brightness contrast feature and then you realize that although physically things are changing, psychologically you are not able to make out. So, in the first case although the sound level is changing you are not able to detect it, you

are not able to hear it and then comes a time above which you can hear me. So, similarly if you change the brightness contrast feature, there would be a point when you would be able to make out that this is the object available on the screen right now. So, that very incentives of the stimulus were from absence to presence can be detected by you that is called Absolute limen.

Now, although you are able to make out that I am saying something you are not able to detect the increase in the volume. First case was 0 means absence of the process to presence now within presence you want to increase the volume, now you again knows the use the slider and you see that physically the sound level is increasing, but then you realize that the notable difference that you wanted make, that you wanted to increase the volume up to this level, that is somehow of not reaching and then comes a point when you realize that, yes! Now the sound quality has changed, it has increased and then if you now still continue moving it beyond 100 percent one 150 percent 180 percent, then you suddenly realized that this is no moral lecture it is converts into noise.

So, that very threshold, where the intensively of the sound becomes pain full for you the lecture converts into noise is terminal limen. So, in terms of external attributes of the stimuli that we are sensing in order to assign a meaning to it, what is the intensity of that various stimuli, absolute limen, difference limen, terminal limen has important role to play there. Now along with this comes an interesting thing, right now we have talked about it, that we have to make a distinction between the previous and the new state.

(Refer Slide Time: 10:08)

Weber's Law

- Just-noticeable difference in a stimulus is proportional to the magnitude of the original stimulus.
- Smallest level of difference between two given points of a sensory stimulus that can be detected.

Weber gave a law, basically this is talked about know the area of psycho-physics in experimental psychology we will come to read about it. Here we would be briefly looking at what it means and why it is so important for psychologist to understand with this law - he says that the just noticeable difference in the stimulus is the proportion of the magnitude of the original stimulus.

So, there is a smallest level of difference between two given points of a sensory stimulus that can be detected. So, if you are able to know realize that this is the magnitude of the original stimulus and if the magnitude of their incoming stimulus is above this level, only then that difference can be detected. The best example of it could be that you hold a torch in your hand and go in a bright day light, whether your torch is switched on or off you are not able to make your sense out of it because the outside light is brighter than the light of the torch, but the same phenomena if you repeat in dark situation you would very easily be able to detect that your torch is on; the reason being that their magnitude of the stimulus, the intensity of the light which is imitated by the torch in the first case this is much less than the light already available in the environment. So, during day time you do not detect the torch is on where as in the night dark you are able to detect it.

(Refer Slide Time: 11:52)

Just Noticeable Difference (jnd)

- Example- If the headlight of the vehicle is on during night, it is noticed unconditionally; during daytime it is not.

Take another example if the head light of your vehicle is on. Now during day time once again you would not be able to make out whether the head light is on or not. In the dark situation whenever the outside light decreases, you would very easily be able to say that, but the headlight of my vehicle is on. So now, because the existing intensity, the intensity of existing stimuli, if that is strong enough, then the intensity of the new stimuli has to be above that to be detected, that is what is called as Just Noticeable Difference.

(Refer Slide Time: 12:42)

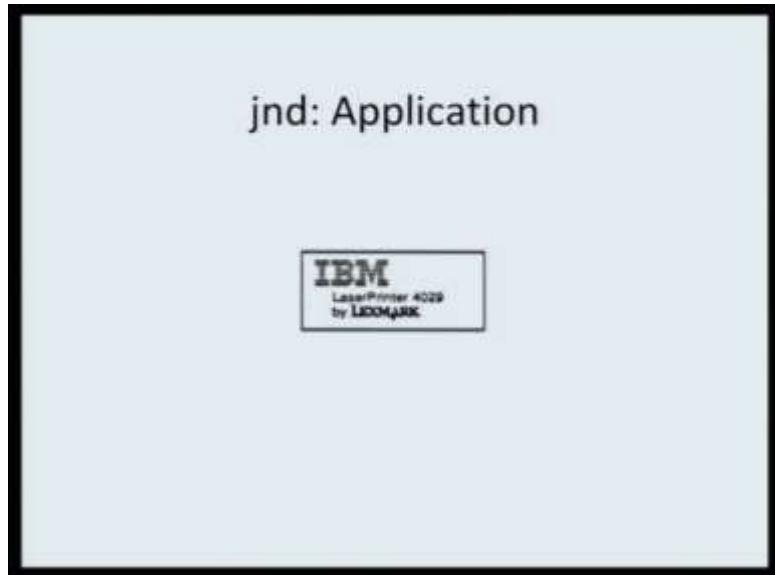
jnd: Application

- Change in brand name



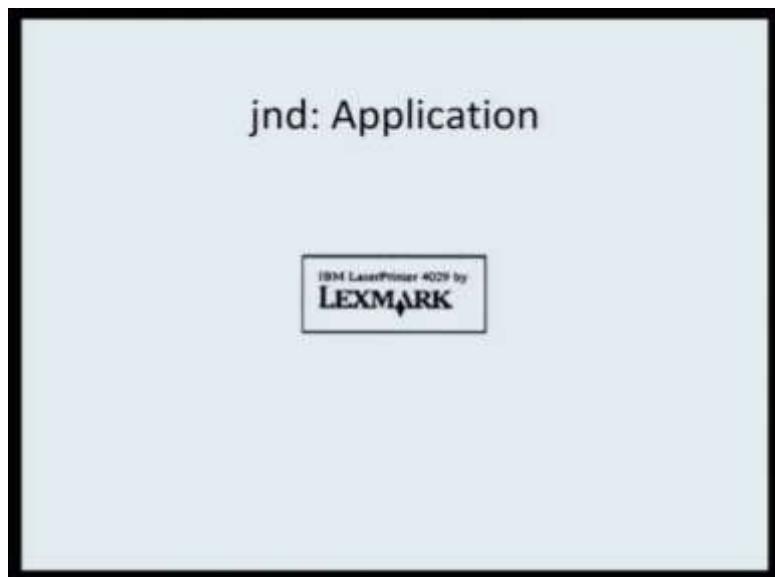
I will give you two examples. The first example is of the changing the brand name, when IBM introduced Lexmark printer. Look at the change in the logo that you see of IBM.

(Refer Slide Time: 12:57)



In the first case you see only IBM. Now, you are see IBM Lexmark 4029 by LEXMARK just look at font size also. So, earlier you had only IBM, now you have addition of laser printer 4029 by LEXMARK.

(Refer Slide Time: 13:10)



Now, there is change. Suddenly IBM laser printer 4029 the font size decreases and LEXMARK has replaced the other remaining space.

(Refer Slide Time: 13:21)



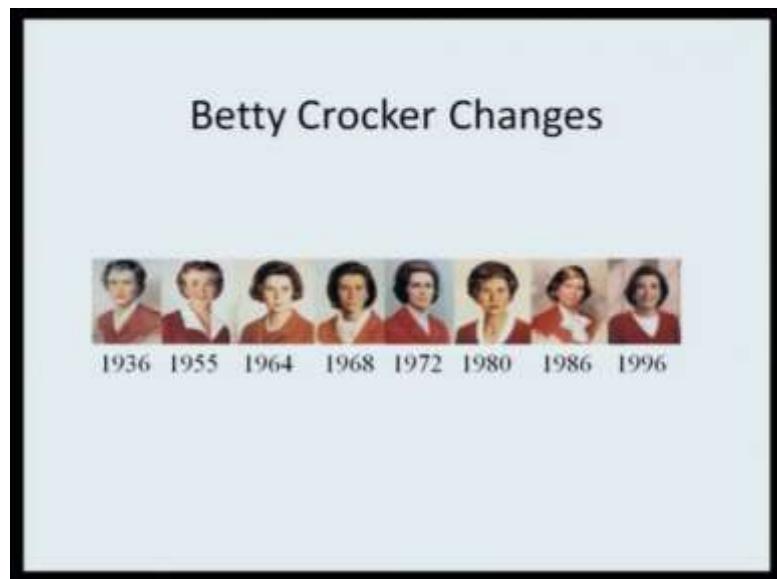
And then you see Lexmark goes in the top, laser printer 4029 comes at the bottom and IBM is removed. Now this is an interesting application of just noticeable difference now if you look at the first logo and the last logo you see a big difference. Why? you saw that difference because there was the difference in the space in the defined area of the logo had stark difference, but if you look from one face to the other and gradually if you look at the four phases; that means, that while positioning this printer IBM wanted that in the memory of the users, Lexmark printer should be attached to IBM and therefore, there it should not be considered this is something new that has come to the market rather the existing brand name should suffice the positioning of Lexmark printer.

(Refer Slide Time: 14:27)



Now, let us come to another example. This is the example of Betty Crocker; now Betty Crocker over the years when they changed their brand ambassador.

(Refer Slide Time: 14:36)



Now, look at this change you know right from 1936 to 1996 you see that a series of models were used for endorsing the product. Now the lady in 1936 is far different from the lady that you see in 1996, but if you look at the intermediate faces, the model who endorses the brand 1936 and the get up of the model who endorse the brand in 1955. You see much of similarity. Similarly between 55 and 64; 64 and 68 and then you realize that

Betty Crocker basically what it was trying to do is that the models who were endorsing the brand the difference in their physical appearance, they tried their best to make it come below the just noticeable difference level.

Now, if the previous and then new, these two models, their physical appearance if does not touch the just noticeable different level; that means, you would consider that some makeup has been changed, but by and large the person who endorses the brand remains the same. These are the interesting applications of just noticeable difference our real life.

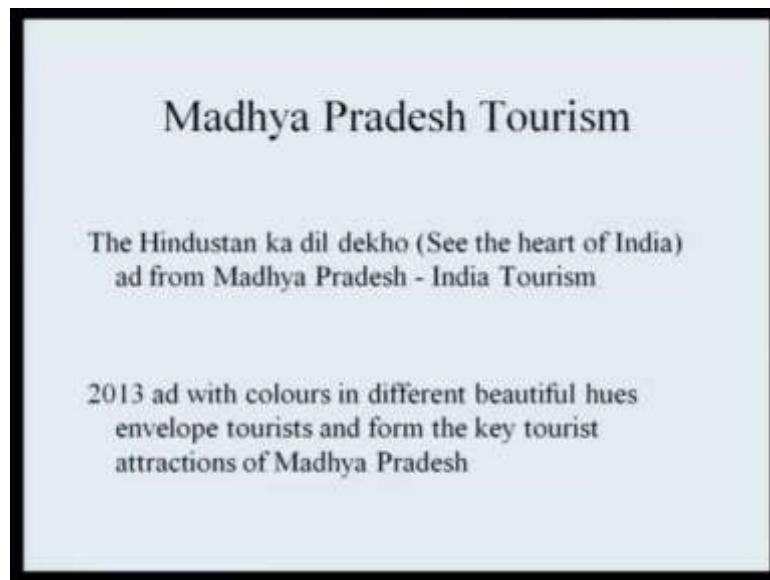
(Refer Slide Time: 16:06)

Weber's Law

- The change required for getting a stimulus perceived as 'different' will depend on its initial strength.
- Stronger the stimulus, greater the requirement.

Now, the change that is required for getting a stimulus perceived, as different will always depend on the initial strength. That would mean that stronger is the stimulus in the first case for establishing your brand in the present example, you require that the signal of or the strength of the incoming stimulus should be very very strong. You must have seen these two ads of Madhya Pradesh tourism.

(Refer Slide Time: 16:34)



(Refer Slide Time: 16:40)



Now, let us look at the first add. Now, you have a very nice depiction in a very very artistic form the major tourist destiny destinations of Madhya Pradesh has been shown to you. This was one of the very popular ads of tourism and then much later in 2013, another adds for Madhya Pradesh tourism came into being. Now you remember one thing, the way the previous add know which said known Hindustan Ka Dil Deko, See the Heart of India and the way the entire tourist destinations were depicted and the face of the women was taken into account to express the emotional component that would be

embedded in this whole phenomena was done certainly you know something very very exceptional.

Now, when in 2013 Madhya Pradesh tourism decided to replace this very ad by another ad. There was a necessity because the first signal had such strong strength that the next ad had to be much more superior to that in terms of it is signal. I am seeing basically talking about this very example to explain the importance of Weber's law in psychology. Now look at this very ad.

What you see here is that the same tourism destination which was depicted in the previous ad are being once again being visible shown to you, but this visual representation is now in terms of using various colors, in different beautiful hues. Now the form is created of the say tourist destinations that was shown in the previous add also, but instead of showing you that image of, the tourist destination now it is colors in different hues which are used to give you mental image of that and this would primarily now show you that see, the previous ad was so in fact that the next ad to have very strong strength of the signal to be received, if it is going to replace the existing add.

So, in terms of now real life situations this is; however, Weber's law has a very important role.

(Refer Slide Time: 21:49)

Perception

- Till now we have discussed how we sense the incoming inputs from the environment. All of them refer to sensation.
- Sensation refers to the stimulations one receives from the sense modalities.
- Perception is preceded by sensation.

So, till now what we have discussed is that the incoming inputs from the environment, they are assigned a meaning and once we succeed at assigning a meaning to it we said at this is perception.

(Refer Slide Time: 21:56)

Perception

- To ensure that a sense modality receives stimulation, the stimulus must reach absolute threshold.
- Absolute Threshold refers to the minimum intensity of stimulus that the receiver can detect fifty percent of the time.

Now, to ensure that sense modality receives stimulation, the stimulus must reach absolute threshold. Therefore absolute threshold becomes the minimum intensity of stimulus that the receiver can detect at least 50 percent of the time.

(Refer Slide Time: 22:14)

Perception

- When we attach a meaning to what we have sensed, perception is said to have taken place.
- Hence, whatever we experience is our perception.
- The sensory cues that are received by the brain and the relevant past experiences that one already has are organized to derive this meaning.

When we attach a meaning to what we have sensed, we say that perception is taken place and whatever we experience is our perception. Therefore the sensory cues that are received by the brain and the relevant past experiences, that one already has, it is derived back to our working memory in order to provide meaning to whatever we have sensed.

So, this is how perceptions takes place, but remember one thing perception need not always emulate reality.

(Refer Slide Time: 22:48)

Perception

- Perception doesn't emulate reality.
- The raw information received by the brain are transformed or reworked in order to perceive it.

The raw information it is received by the brain is transformed or it is reworked in order to perceive it.

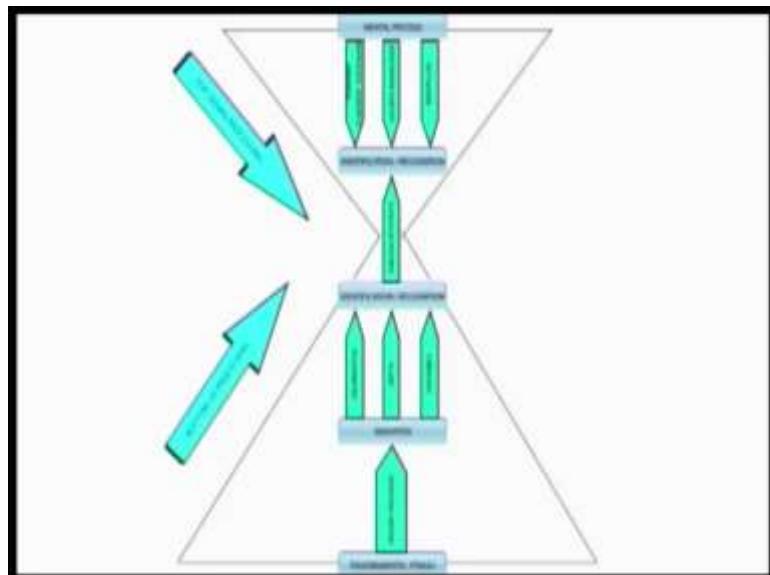
(Refer Slide Time: 22:59)

Perception

- Hence, a percept is an outcome of mental processes such as form synthesis, feature differentiation, recollection of past experiences, and stimuli comparison.
- These operations can be top-down or bottom-up.

Hence a percept is an outcome of mental process. Such as form synthesis, such as feature differentiation recollection of past experiences and stimuli comparison. So, these operations can either follow top down process or it can follow bottom up process, let us understand this.

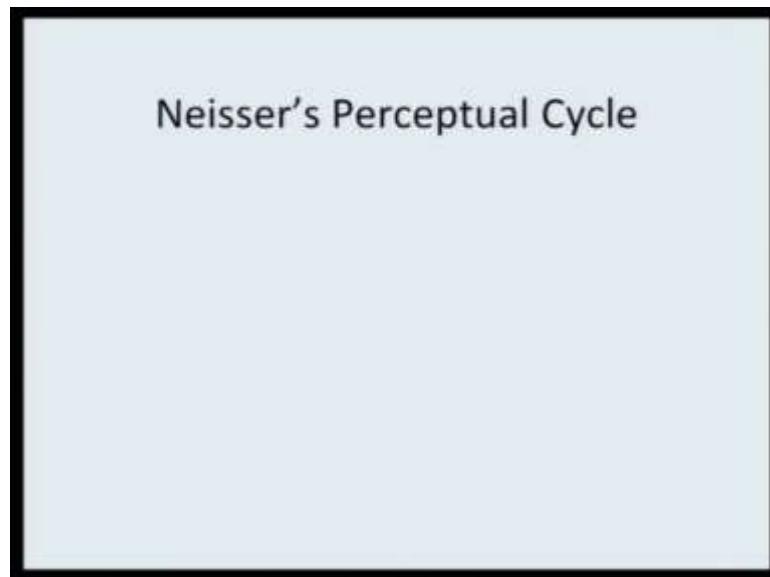
(Refer Slide Time: 23:23)



The knowledge and memory pertaining to this stimuli and the language to understand and express it are crucial. Expectations and belief and motivation are also important. All these constitute mental processes and are top down processes. The environmental stimuli

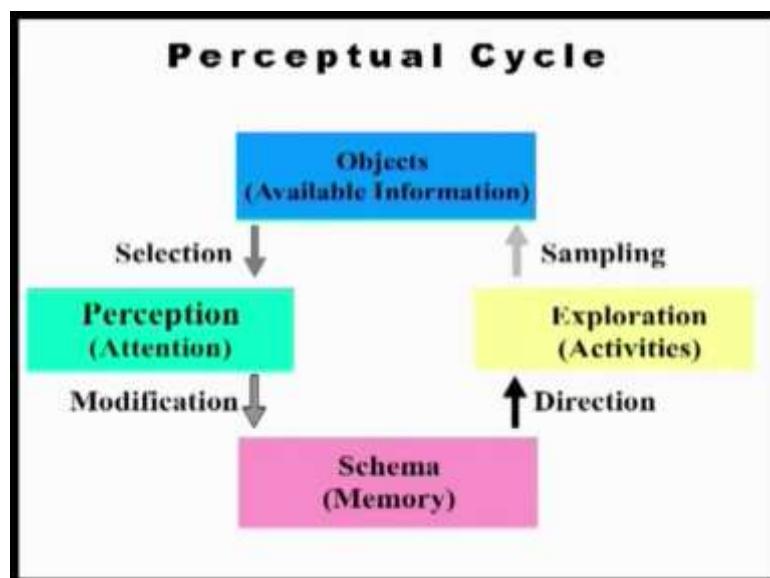
are processed by the sensory organs, this leads to sensation, these stimuli undergo perceptual organization based on their inherent characteristics. These are the bottom of processes. A synthesis of these two processes leads to identification or recognition of the stimuli.

(Refer Slide Time: 24:01)



Let us now understand perceptual cycle proposed by Neisser.

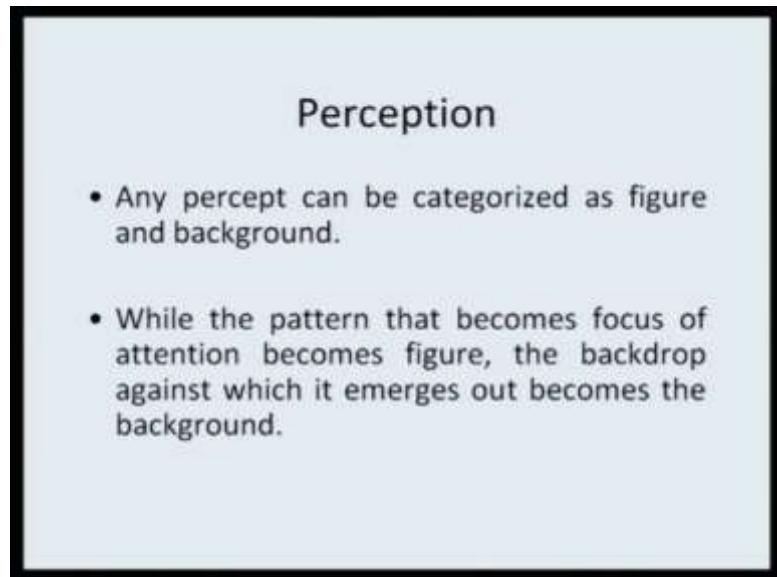
(Refer Slide Time: 24:06)



In 1976 Neisser proposed a model integrating the bottom up and top down process into a cyclic process. This model focuses on the perception, attention and categorization. While

perceiving an object, one selectively attends to the available. This is further modified by anticipatory Schemata.

(Refer Slide Time: 24:37)



So, what we have understood now is that any percept that can be categorized for assigning a meaning has to be differentiated in terms of figure and background. So, while the pattern that becomes focus of the attention becomes the figure, the backdrop against which the figure is seen is considered as background.

For instance if you are looking at me right now, if I am the object, then this green background against which you look at me becomes the background. Say if I write something on this green board and if you are looking at that very object although it is standing front of that green board I become part of the background and the concept, the alphabets sentence is written on the green board becomes the object. So, figure and ground always remains interchangeable in nature and little later, we will come to the concept of contour, where we would be basically talking about the fact that more you are able to make a distinction between figure and the background, more clarity you have in terms of perceiving object in the real world.

So, we will end here and we will once again continue with the strength of the signal in our third lecture.

Lecture – 07
Perception Theory of Signal Detection

Let us now recapitulate whatever we have discussed till now. First lecture we focused on sensation, second lecture we looked at the concept of liman or threshold, we looked at absolute difference and terminal liman, then we talked about Weber's law and we took certain live examples I would say to understand how the concept of threshold and how the concept of intensity of the stimulus the way it is described in Weber's law, how that makes an important type of a contribution in terms of understanding our physical world.

Then we ended the second lecture saying that always you one has to know figure out one has to extract the figure against the background. And this very idea of categorizing figure versus the background is an important phenomena in perception. We also said that figure and background could be interchangeable and we always look for contours if we are able to establish it well and good if we are not able to establish it we have confusion. Little later I think towards the end we would also take some of the examples of reversible figure.

(Refer Slide Time: 01:41)

Perception

- A figure need not always be in front of or above the background.
- The process of making distinction between a figure and the background also depends upon the search for contours.

Reversible figure means, if you look at it from one point of view then you see another type of an impression emerging out. So, something half of the figure becomes the background and remaining half becomes the figure and then it keeps changing. And depending on what you consider as background the figure changes, but that we would see little later. Right now, we are again looking at the strength of signal. Let us come to an interesting theory.

(Refer Slide Time: 02:09)

Theory of Signal Detection

- Roots in communications & radar system.
- Draw attention of psychologists in the 50's and 60's
- Understanding behaviour while detecting weak stimuli
- Difficult to be explained by traditional theories of thresholds

Basically this very theory has its root in communication and radar system, but in 1950's 60's it dragged the tension psychologist because psychologist were interested in understanding human behavior. And they tried to understand the strength of the signal and its role in detection of the stimuli especially in conditions where the intensity of signal is very weak. What was realized that Weber's law ,Fechner's law these laws were not sufficient enough to explain how human beings respond in situations when the signals are weak. And this lead to what is called as Theory of Signal Detection.

(Refer Slide Time: 03:03)



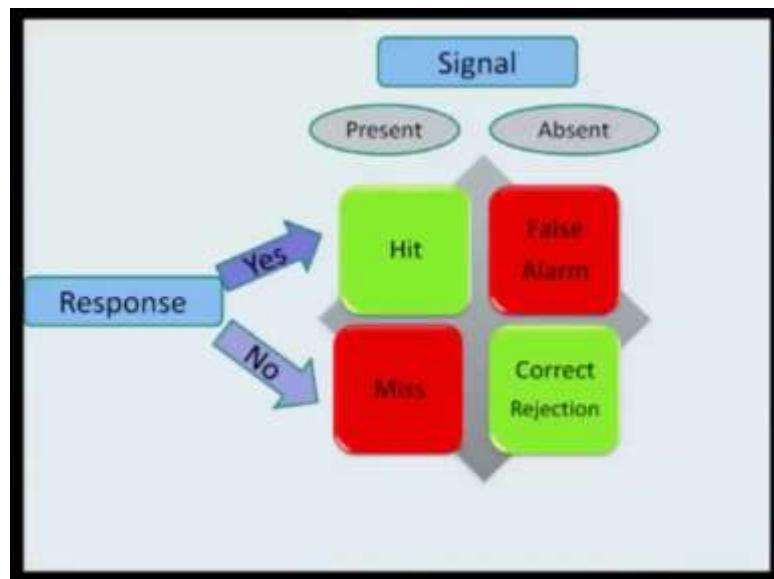
Now look at this screen, you see fighter aircraft, the radar system. And the radar of course, has to be sensitive enough to receive this signal back from the flight and finally signal has to be detected by a human being.

(Refer Slide Time: 03:35)



So, when you look at the radar system everything seems very nice, but the problem with the human operator is that he or she has to figure out the presence of the signal. Again some type of a noise. Noise in psychology here is whatever is not your intended target is the noise. Let us understand this very theory by taking this example.

(Refer Slide Time: 04:08)



You make a grid it is a two by two grid, so whether the signal is present or the signal is absent that is category one. And category two in terms of the human response the operator says yes or no. So, yes versus no in terms of human response, presence versus absence in the case of signals. What are the possibilities? First, when the signal is present and the person responds yes it is present. This is called hit condition. Second condition when the signal is absent and the respondent says that yes signal is present. although signal is absent. This is called false alarm.

The third situation when the signal is not present, and the respondent says that it is not present, this is correct rejection, and the fourth situation where the signal is present, but the persons says the operators says that no it is not presented. This is a miss condition you have miss detecting signal.

Now, why this is so important from of course communication prospective, the radar system it make sense because the radar is suppose to detect the signal so that it can make distinction between the own aircraft versus enemies aircraft. But signal in itself does not make any sense, the human operator has to detect the human operator has to say the fine I have identified this signal which we are saying that this is hit condition or the signal is not present you say that fine signal not present it is a correct rejection. These two conditions are fine. But think of two other conditions that is marked red here, that the signal is absent and you say it is present it is a false alarm.

What would this mean? If you have a system for combating the enemy aircraft that is forcibly entering into your territory and you are the operator who based on the understanding of the radar signal gives a signal, that fine the enemy aircraft has entered into our territory. The field guns will start firing at that very aircraft. You committed a mistake. When the signal was absent you said that is there is a signal and therefore you raised a false alarm against which the support system started combat operation. And the second case is again far more dangerous where the signal is present but you said, no it is not present, then enemy comfortably enter the your territory. There is the big prize that the country pays for that.

So, you realize that the role of the human respondent is extremely important in terms of detecting the signal. And that is reason why signal detection theory is taken into account when we look at the perception mechanism. Now in terms of detection of this signal what is very very important is the strength of the signal. Remember in the second lecture also we were saying that the strength of the signal has to play role and because the signal has to be detected therefore it is called that fine this is the discriminability index.

(Refer Slide Time: 07:41)

Theory of Signal Detection

- Discriminability Index (d'): This is the estimate of the strength of the signal.
- The signal is discriminated depends on the separation and spread of noise and signal and noise curves.

This is the strength of the signal and the way you estimate it and accordingly that would shape your response. So, the signal is discriminated depending on the separation and spread of noise in signal and the noise curve.

So, you take one experimental example here and then you would move to graphical plotting of the response in this very situation what is called as the ROC curve.

(Refer Slide Time: 08:14)

Theory of Signal Detection

- Percentage of hits and false alarms depends on individual's sensitivity to the signal (d')
- Cost-benefit analysis of a situation

Now, the percentage of hit and false alarms depends on the sensitivity of the operator to the signal. Signal has strength that we have discussed still now and we have said that fine it is the strength of signal which plays an important role. Stronger the signal higher are the chances that we will detect it, but besides the strength of the signal what is also important is that I as an operator how sensitive I am. And that would be dependent on the cost benefit analysis. What would be the cost benefit analysis? I am rewarded or I am punished for the response that I elicit therefore, cost benefit analysis will always play an important role.

(Refer Slide Time: 08:57)

Theory of Signal Detection

- In a given perceptual task one has to detect a given stimuli (signal) in the backdrop of non-stimuli (noise).
- This means that a decision outcome always comes amidst some degree of uncertainty.

So, in a given perceptual task one is always suppose to detect the signal that is the stimuli against the non signal that is the noise. And this means that decision outcomes always comes amidst certain degree of uncertainty. You are not very certain, the strength of the signal plays an important role, and your sensitivity plays an important role.

(Refer Slide Time: 09:17)

Theory of Signal Detection

- Variation of criterions: Experimental demonstrations
- d' remains unchanged-
- If P is rewarded for hits and not punished for false alarms, then the subject should set the beta very low and maximize hits, not worrying about false alarms. This would a lax criterion.

Let us look at one of the experimental demonstration of this. We are taking a case that fine now the strength of the signal remains constant. In the first case what we were saying was that the strength of the signal changes and therefore it has an impact on the response. Now we are saying that strength of signal is a made constant and it is cost benefit analysis that you make as operator, fine.

Now, if the operator is rewarded for hits, but he is not punished for false alarms then the beta value that one sets is very very low. And this, what happens is it will maximize the number of hits because the operator is not worried about false alarm. The reason he is rewarded for hit, but he is also punished for the false alarms. Even though I committee an error I do not get any adverse remark for it and if I succeed fine it is very good. So, what I would do I would relax my criteria. Earlier if I was using a very very stringent filter to say that whether the signal was present or absent now I do not do that.

What has happened to me? My relaxation of the criteria which leads to maximizing of hits because I am not worried about the false alarm is primarily guided by this cost analysis that I am making that I am not paying a cost, but I am always deriving a benefit out of it. So, cost benefit analysis comes into play here. Think of the other situation d prime has not changed now.

(Refer Slide Time: 11:07)

Theory of Signal Detection

- Variation of criterions: Experimental demonstrations
- d' remains unchanged-
- If P is not rewarded much for hits but punished for false alarms, then the subject should set beta very high so that false alarms will be low. This would also result into low hits.

So, the strength of the signal has not changed but I am not rewarded much for hit, but I am punished for false alarms. What would I do? My beta will be very high. So, that the false alarms also become low. This of course would also result into low hits. So, if I am told that fine whether you go for a hit you correctly identify the signal is important but it is not as important as if you committ an error while doing that. Take situations; say in the court of law two attorneys are arguing against a possible client who is likely to get death penalty. The cost involved is very very high. And therefore, what happens you suddenly realize that your beta is now very high because you do not want to create a false alarm, you do not want to argue saying that he is culprit because you know that if proven guilty the court will give him a death penalty. So, you walk with extreme degree of caution.

The previous example of the aircraft and radar warning system that we were taking, if your signal by default you press a button raising an alarm and in turn it triggers air strike you would be very very cautious; because false alarm the prize that you pay for it is very high. You understand this situation now. Case one, when hits are rewarded and false alarms are punished. In second case when hits are not rewarded, but then for creating false alarm you receive punishment.

(Refer Slide Time: 13:16)

Theory of Signal Detection

- Variation of criterions: Experimental demonstrations
- Graphically plot the results with false alarms on the x axis and hits on the y axis.
- The curve represent the pattern of responding expected for a given d' at all values of criterion. This curve is called the receiver operating characteristic (ROC).

Now, if you graphically plot the result with false alarms on the x axis and the hits on the y axis you get a curve and this curve is called the ROC curve; the Receiver Operating Characteristics curve. This curve represents the pattern of responding expected for a given d' prime at all values of criteria, so you change your criteria. The d' prime remains the same and then you see that how depending on the criteria that you have selected and the value of that criteria the curves will change.

(Refer Slide Time: 13:50)

Theory of Signal Detection

- Variation of criterions: Experimental demonstrations
- When d' is 0, noise and signal + noise curve are the same and false alarms and hits will be the same. That is represented by the diagonal in ROC graph.

Now when d' prime is 0, noise and signal plus noise curve are the same and false alarms and hits will be the same. That is represented by the diagonal in ROC graph.

(Refer Slide Time: 14:06)

Theory of Signal Detection

- Variation of criterions: Experimental demonstrations
- As d' increases, the ROC curve bows away from the diagonal.

If d' prime increases the ROC curve bows away from the diagram.

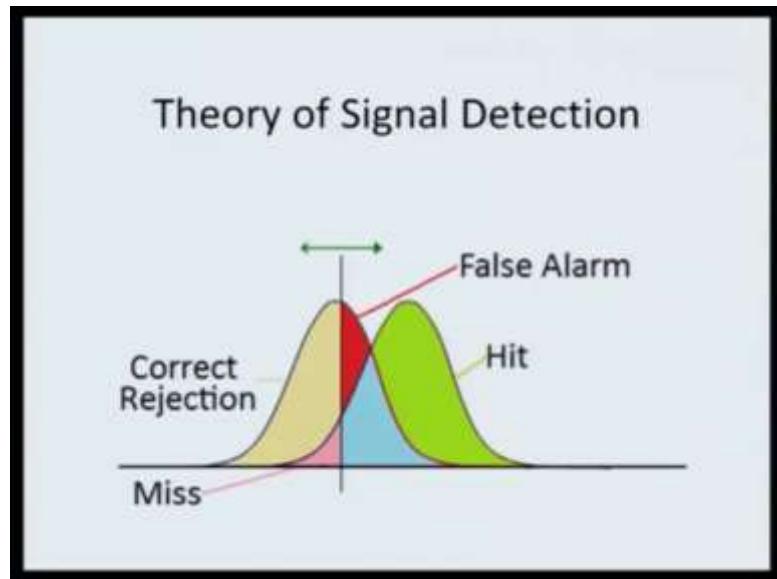
(Refer Slide Time: 14:12)

Theory of Signal Detection

- During second world war ROC curve was used for analyzing radar signals.
- Later it was used for representing signal detection in psychophysics.

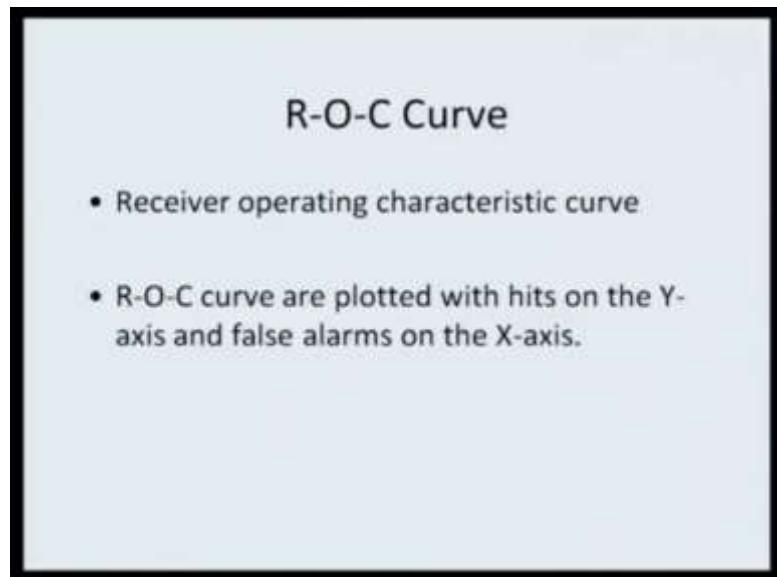
And you would realize the practical implication of it of the fact that during the Second World War ROC curve was used for analyzing the radars signals. Of course now we talk about it fondly discussion on signal detection in psycho physics.

(Refer Slide Time: 14:32)



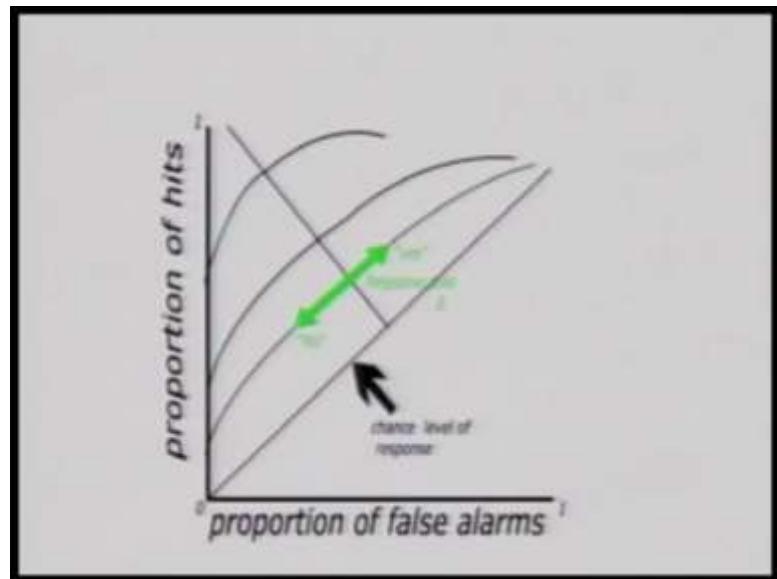
So, you see the graphical representation here, the correct rejection, false alarms, hit and the miss that is defined by the Theory of Signal Detection.

(Refer Slide Time: 14:46)



And now look at this very video which explains ROC curve.

(Refer Slide Time: 14:54)



Look at this graph now you have the proportion of the hits and then you also have the proportion of the false alarms and then of course you have the chance level of response wherein know depending on the d' prime as such, you give your hits and the false alarms. So, the detection of the signal will actually dependent on your ability to discriminate between the signal against noise, the stimuli against the non stimuli. Think of the other example; in real life situation where one has to detect signal and miss the noise ,the best example in the present day would be camouflage situation.

(Refer Slide Time: 15:38)

Camouflage

- Real life situations where one has to detect the signal amidst noise.

When you try to make the signal of the stimuli is weak enough so that the figure and the ground cannot be detected as two separate situations.

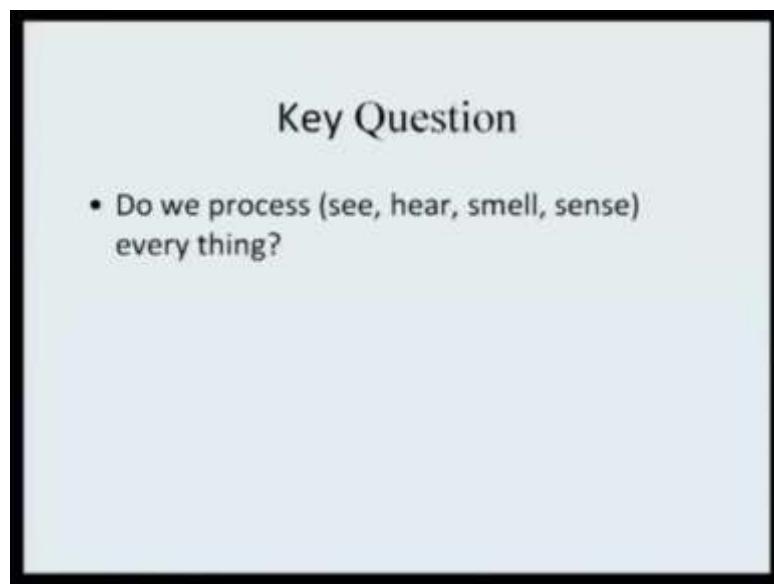
(Refer Slide Time: 15:52)



You must have seen movies, in real life's, several images where you have an individual who will put different colors on the face or put some bushes on the hair will add some

bushes the body also, uniformed at the way were they also multiple colors. And then when you make a survey when you look at the object from a distance you are not able to detect the background and the stimulus. So, the object is not very clearly perceived against the background that against which is seen.

(Refer Slide Time: 16:39)



So, coming back to our key question that we initiated in our second lecture; do we process everything? What do you say now, what we have discussed till now that number one it is the intensity of the signal that we receive in the environment that would determine whether we would be processing it or not number one. But number two what we have also seen is that the characteristics of the criteria evolved by the user the individual who responds also important. So, the intensity of the stimuli and one two what I decide the criteria that I said for responding both these things will have its importance when it comes to responding to a given situation.

Now that we have understood that fine, the intensity of this signal and the criteria that we set both of them have a role to play. And fact we are now saying that all images all figures have to be extracted out of the ground. What is important once again we are coming to this concept that you have to draw a line difference the contours.

(Refer Slide Time: 17:57)

Figure & Ground

- Contour is the gradient change between the elements of a percept.
- Ambiguity in contours leads to reversibility between figure and the background.
- Edges & Contours are critical.

Now, basically contours are nothing but these are change in the gradient between the elements of a perception. So, ambiguity in contours leads to reversibility and I said that little later we will see few examples of reversible images. But in reality in most of the cases we have the edges and we have the contours. If you are able to establish this distinction then you would be very easily able to see visual image against a background and similarly you can hear a sound against the noise that you are hearing.

(Refer Slide Time: 18:36)



Look at this very example; a famous example that you find in all text books. What do you see here, is all know mix of black and white patches, it is extremely difficult to decipher what is object and what is the background just concentrate at it. Are you able to see? Now let me help you out. Try to look at this very area, can you see the object now? Answer is yes. How you can now detect the object, because in this case this was the area that you are shown and very conveniently now you can look at these black and white patches and you can make out that you are looking at a dog against familiar type of background. Exactly similar type of thing works when it comes to human beings.

(Refer Slide Time: 19:37)



Now, look at this very example. This is a photograph published in news paper where an Indian army soldier is shown in a camouflage and he is basically taking part in an exercise Sudarshan Shakthi in somewhere in Barmer district in Rajasthan. Now if you look very clearly it very difficult if the same soldier is put on the ground and you look at the background there making distinction between the figure and the background becomes very difficult.

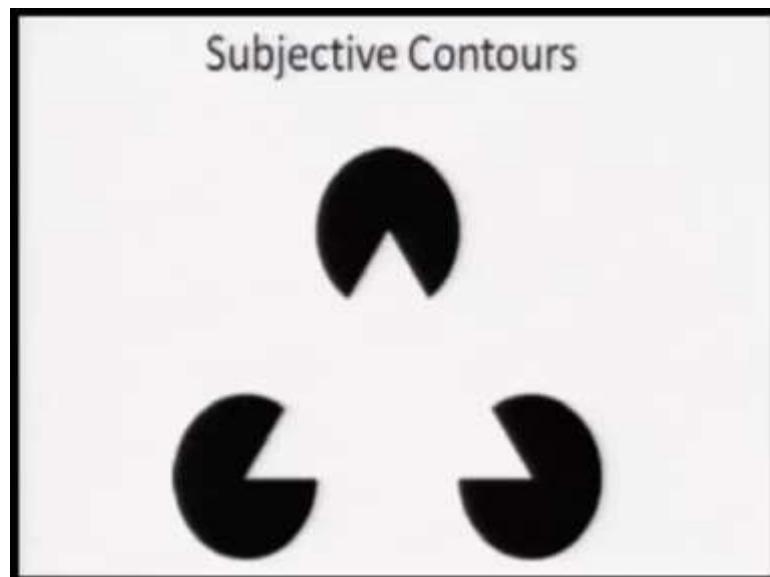
Now if you compare all this, the first case where when we were trying to look at the flying aircraft and somebody sitting in front of the radar screen who is suppose to detect the stimuli how difficult it would be. You saw the back and white patches where you are supposed to look at the dog against the similar background how difficult it was. And again here you see it would be extremely difficult if you are not told what you are actually looking at and that too where looking at a very close shot. If nothing of this information was given any you are looking at this very objective from a distance it would have been extremely difficult to extract the image the figure out of the background.

Now coming back to the example of subjective contours, these where the cases where contours are still available. The strength of the signal makes that very difference. And of course your sensitivity. So, one is your sensitivity other is the d' prime value these two

things would make a difference. But, case is where the contours are missing what do we do? And it has been observed that as human beings we create our subjective contours.

And subjective contours play extremely important role the reason being that what you actually see in environment does not have that line of distinction, and because you have to read the figure against the background. So, what would be the possible figure and what would be the possible background would depend primarily on the fact how you are subjectively training to draw that line of distinction what is called as controversy. Look at this vary video to understand subjective contours.

(Refer Slide Time: 22:15)



Look at this image, what do you see? If I ask you are you looking at white triangle lead over three circles, the answer could be yes for many of you. Or you just then perceive that it is actually three independent circles with a piece cut out from each of them, but there is no triangle as such.

So, it could be very easily interpreted as if you actually look at three independent black circles with the piece cut out of them and there is no triangle as such. But even though the background is white I am sure all of you would when you look at this image you

automatically draw a line to complete the triangle. To perceive that there is a white triangle above this, this is subjective contour.

We have already seen this image let us look at it again look at the three black circles in the triangle. You can see a sharp gradient change between the circles, triangle and the background. Now move the triangle and super impose it over the three triangles, you still see the triangle by filling creative subjective lines. You do not see three circles with piece cut out of them. Well, you were aware that the triangle was super imposed on the circles. Now see these three circles, they all have a piece cut out of them all though this time a triangle has not been super imposed you still perceive white triangle a put over three black circles. This was an example to demonstrate the concept of subjective contours.

Now that we have understood subjective contours in the next lecture we would be focusing on perception of form, how do we make out the forms that we see in the world, shape, size, and all these things.

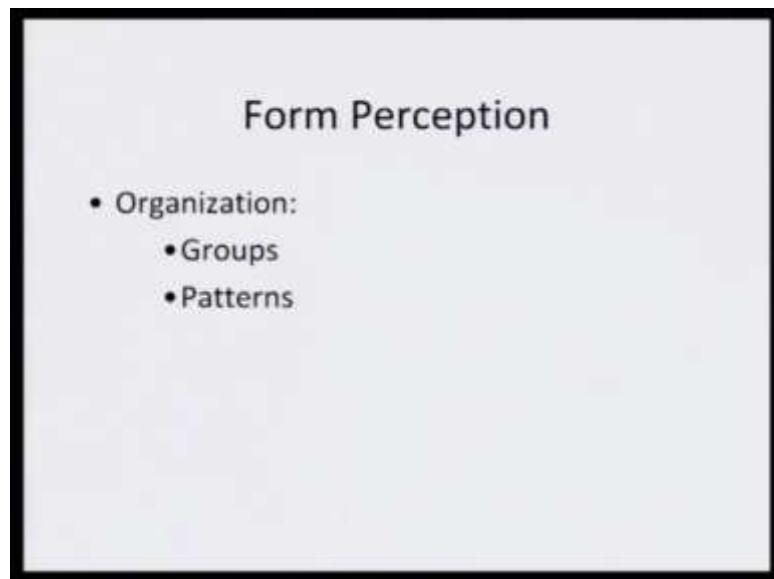
Key words -signal detection, hits, false alarms, roc curve, contours ,camouflage

Introduction to Psychology
Prof. Braj Bhushan
Department of Humanities and Social Sciences
Indian Institute of Technology, Kanpur

Lecture – 08
Perception Gestalt Principles

Till now, we have talked about what you call extraction of image from the background depending on one, the properties of the external stimuli, two, the readiness of the person who is trying to perceive the object and three, what we were talking now towards the end of the third lecture was the idea of drawing contour, so that the image can very easily be extracted out from the background.

(Refer Slide Time: 00:46)



Form Perception

- Organization:
 - Groups
 - Patterns

So, today we would be talking about Form perception. Wherein we would try to emphasize on the organization of form, how groups and patterns they emerge.

(Refer Slide Time: 00:58)

Gestalt Principles

- Kohler- Which gestalts would be formed from ambiguous stimuli
- Law of Prägnanz: Simplest organization demands minimal cognitive effort.
- In German Prägnanz means 'clarity'.

And in this context we would be talking about the Gestalt Principles. Gestalt basically means whole, complete. According to Kohler, Gestalt would be basically formed from ambiguous stimuli.

So, how you try to complete your perception, based on whatever is available to you, that is that holistic part of the percept is the Gestalt Principle. The core principle is called the law of Pragnanz and then there are whole set of laws which are considered as part of Gestalt Principles. Now law of Pragnanz basically says that the simplest organization is one that demands minimum cognitive efforts. In German Pragnanz means clarity. So, those cues in the external environment that does not required too much of mental effort from your side, in order to decipher the figure from the back ground. Those knob organizations basically would constitute law of Pragnanz.

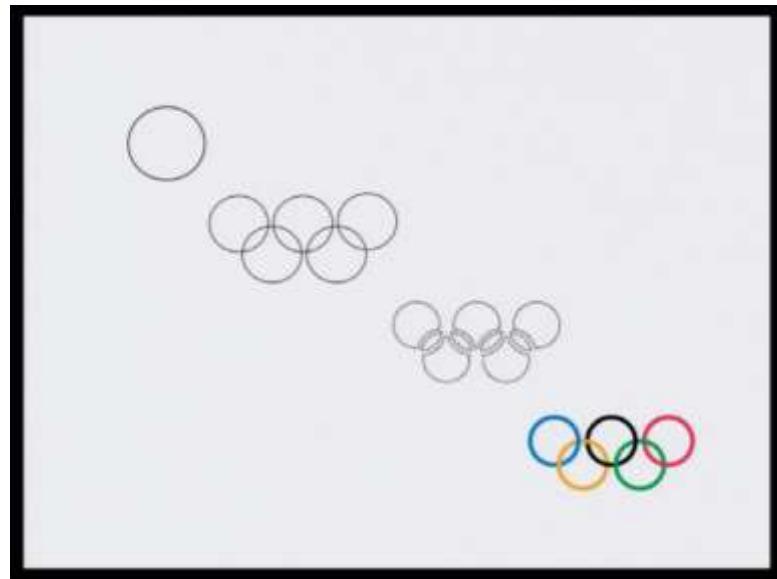
(Refer Slide Time: 02:35)

Gestalt Principles

- Simplest organization- Minimal cognitive effort
- Therefore, they emerge as a figure.
- Simpler and symmetrical forms are easily perceived.

So, that basically means that as human beings we would also always like, to minimize her cognitive engagement in terms of deciphering the image from the back ground. So, simplest organizations would always require a minimum cognitive effort and therefore, minimum time, minimum effort, best type of mental representation that you derive from external environment this is what would be considered as the Principles of Pragnanz. So, simpler and symmetrical forms, these are the two types of forms which are very easily perceived because it is too simple and because it is too symmetrical therefore, you do not have to cognitively engage yourself in too much of know derivation of extraction of cues, derivation of cues, arriving at a conclusion combining them and then finally, deriving a meaning out of it. Hence simpler symmetrical forms will always you perceive very easily by human beings, this what the law of Pragnanzies.

(Refer Slide Time: 03:27)



Now, look at this very circle on the screen. You have one circle, the second circle, third, the fourth and the fifth. Now all of them have come one by one and then they form a pattern out of it. Now when you look at this very pattern, you started from the first, came up to the whole now set of five rings. Now look at the third image there, you could have sense is that way also. So, all types of now combinations where you realized there are a small pieces cut out of the two conversing rings there, but then we do not perceive things in such fragmented order, rather we always look at them as a whole, as a complete. You provide various colors of the rings and this is what we call as Olympic rings.

(Refer Slide Time: 04:25)



Now, this is the logo of Rio Olympics, which is scheduled to be held next year and you do not see all these smaller elements, you do not detach them and perceive them separately rather you always perceive them together. So, simpler, symmetrical and this is what the law of Pragnanz says.

(Refer Slide Time: 04:53)



Look at this very logo. You have three distinct components, but they are too simple and also the form is symmetric. Simpler symmetrical this is what the log of Pragnanz and hence when you promote tourism in Norway, you suddenly feel the basic components which define what Norway means, three elements put in a very simpler format, put in a very symmetrical order and this is what law of Pragnanz is. Perception is very easy, deriving sense is very easy, remembering is very easy, cognitive efforts is minimized and then you are also have the best of the outcome that you want.

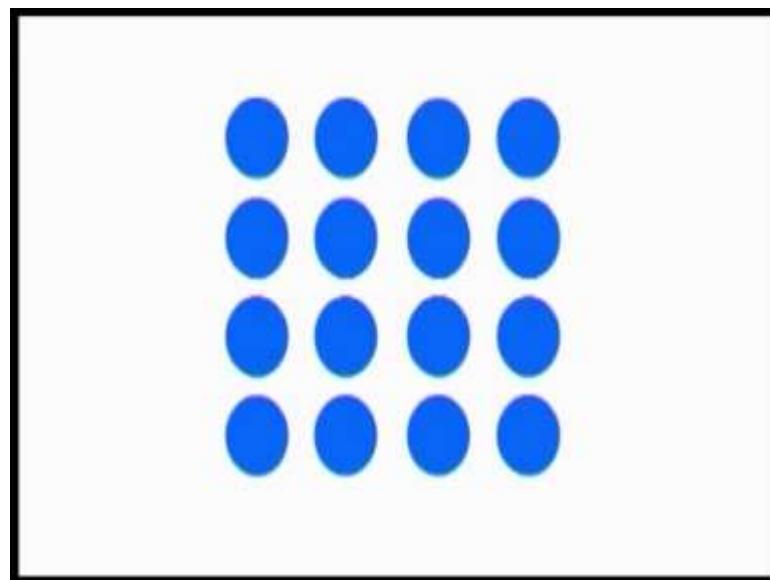
(Refer Slide Time: 05:44)

Gestalt Principles

- Law of similarity: Similar objects tend to group together
- Continue with the earlier example of circles and then take example of a logo

Now, law of Pragnanz is the core of the Gestalt principles and then there are whole other sets of laws. We will talk about them one by one. The second law is the law of symmetry, law of symmetry basically says that similar object that always tends to group together. So, we first in the case of law of Pragnanz we took the example of circles. So, we will continued with the earlier examples of circle and then again now go to the example, which has a logo there. Look at this very video, you find 4 circles there and finally, you have 16 of them now.

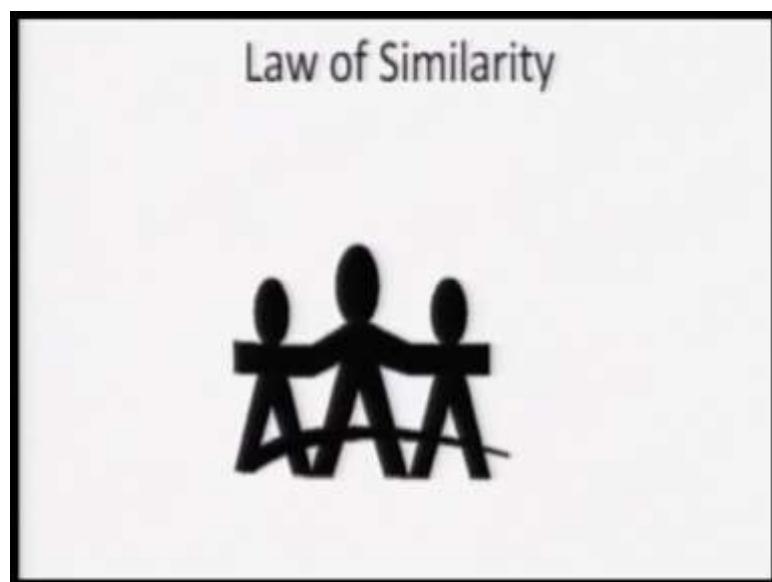
(Refer Slide Time: 06:12)



So, although they are independent circles with tend to perceive them as groups. The colorless circles form one group, now while the rows of red circles form another one. Now let us make this situation little more complex, we had just 4 circles, finally leading to 16 circles and we had the red color ones and the colorless circles now. So, this is how we were trying to look at the formation of groups based on similarity. Now if you have some much more complex situation, once again you have a row of 4 colorless circles multiplying into 4 rows. Just as the previous example, the blue circles form a group when all of them become similar, right now with their blue colors the ones which are bigger either horizontally, vertically, or diagonally they tend to form a group.

So, we basically look at the difference and depending on now what you are actually trying to look at, you will always search for certain reason based on which you can form a group.

(Refer Slide Time: 07:43)



So, that you perceive it better. Look at this very logo, it is very commonly known logo to us and you know actually when you see here, you find law of similarity being used, but we discussed was that similar objects they will tend to come together and here you have now three different representations. All them they tend to group together because they follow the law of similarity.

The next law is the law of Proximity. Proximity means nearness.

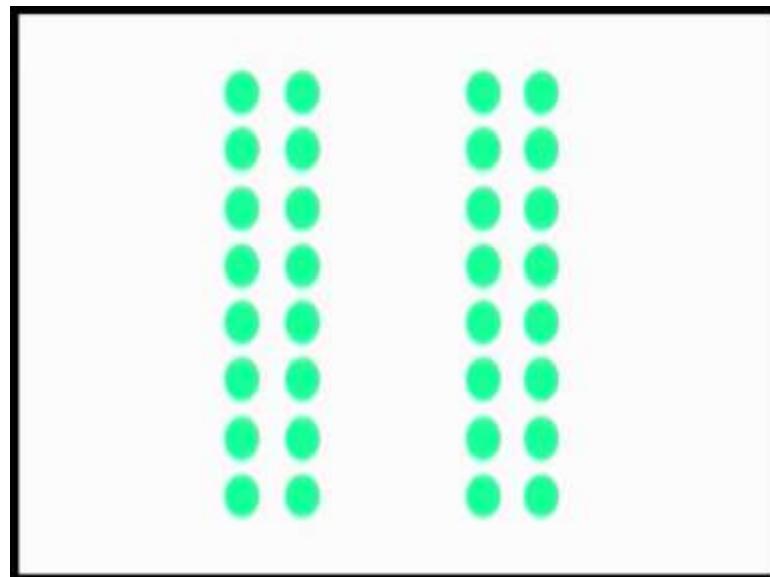
(Refer Slide Time: 08:15)

Gestalt Principles

- Law of proximity: Objects nearer to each other are grouped together.
- Continue with the earlier example of circles and then take example of a logo

So, objects which are nearer to each other, they always tend to form a group. Once again you will continue with the example of circles and then again take an example of a logo.

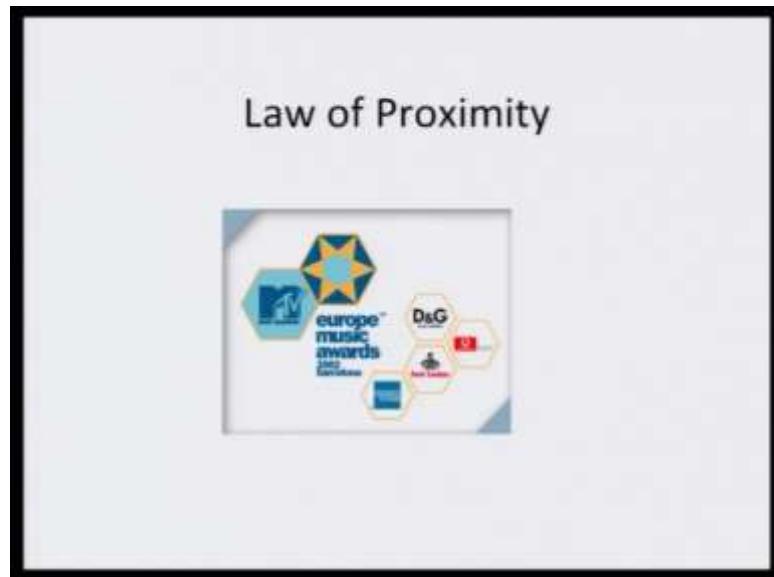
(Refer Slide Time: 08:27)



Initially you see 4 columns of green circles, that are equidistance, but when the 2 columns move closer to each other, they tend to move on the 2 ends. They form 2 distinct groups. The first 2 columns form one group, while the remaining two they form another group. So, this is the law of Proximity. Initially they were now seen as a distinct columns because now they were equidistance, but the movement you have a separation

now you see that now you have one column and the other column although color and the size the form remains the same, this is the law of proximity.

(Refer Slide Time: 09:09)



Now, look at this very logo. Here you have no structures, which basically forms honeycomb, but then they very easily because they are nearer to each other, you can very easily consider that they form one group and you advertise for a particular event along with the sponsors the major sponsors of the event. This is how law of proximity is beautifully utilized in the world of usual communication.

(Refer Slide Time: 09:40)



Look at this very still image from Beijing Olympics. Now here what you find, is that there are whole lot of arrangements and then you have when you look at this very image, you look at things little differently. Now this very segment, they tend to form one group, this very segment tend to form one group, this segment forms another group and this is how you have different types of the representations here, where although the bigger screen carries now whole lot of things. When we look at it we combine separate parts together, and then we try to sign a meaning to the external stimulus that we have been looking at.

Now, law of proximity the way it defines here is that you have things which are closer to each other. So, one set of performers are on the left hand side, who are closer to each other and then there is a big distance between the other groups. So, the left and right very easily get divided. Those in the center of course, they have a different color of the costume, but then there are again separated from the these two groups, but then within themselves they are very close to each other, they are very nearer to each other and hence the law of proximity helps us consider that this is group 1, this is group 2, this is group 3, there all very symmetrical, but then because of their nearness to one group compared to the other based on their proximity we consider them to be forming three separate groups.

(Refer Slide Time: 11:28)

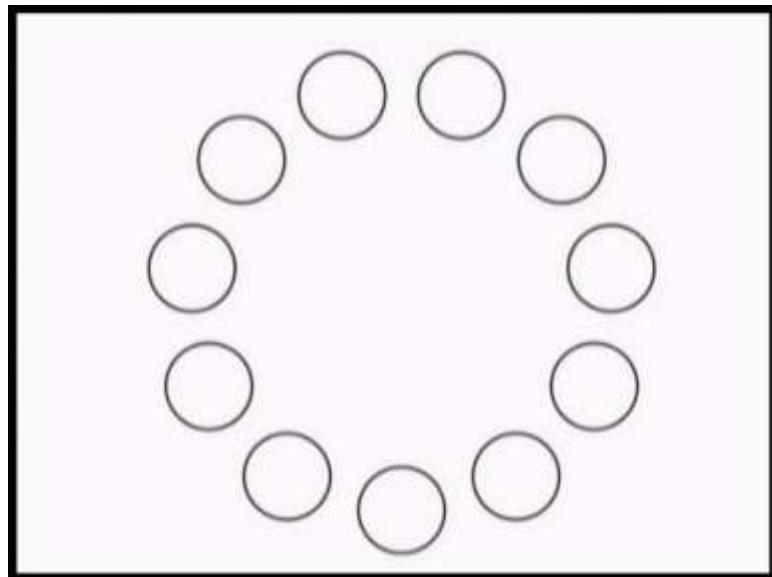
Gestalt Principles

- Law of closure: A discontinuous shape is perceived as complete if it represents something familiar.
- Continue with the earlier example of circles and then take example of a logo

We come to the next law, that is law of Closure. Law of Closure basically says that if you have a discontinuous shape and when you perceive it we always tend to complete it,

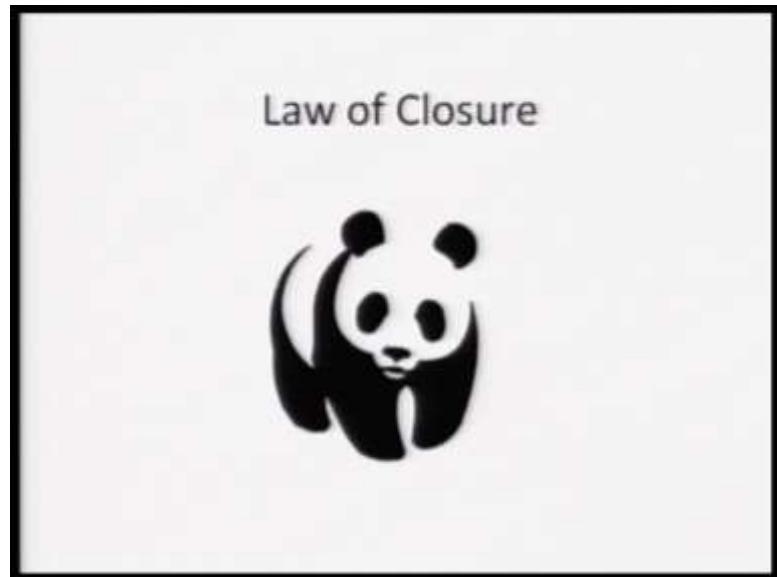
and this complete is based on whatever we are familiar with. Let us take this very example, again we are basing on the example circle and then again we will move on to an example of a logo.

(Refer Slide Time: 11:53)



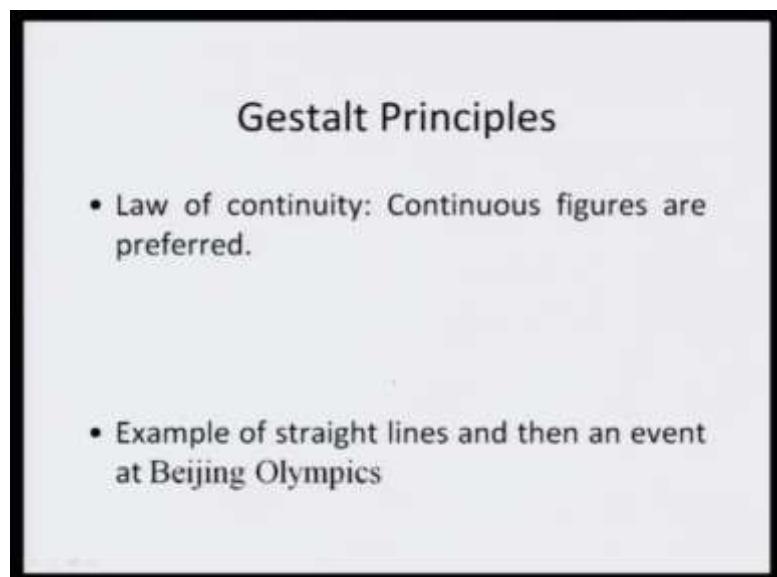
You see a circle right now. Another one and yet another one, although you see 11 different circles, but you perceive them as a ring. Their individual identity is not taken to account. So, this is an important thing here that now when you look at the continuous things. When you look at the patterns that emerge, the discontinuous shapes is perceived as a complete if it represents something very familiar.

(Refer Slide Time: 12:26)



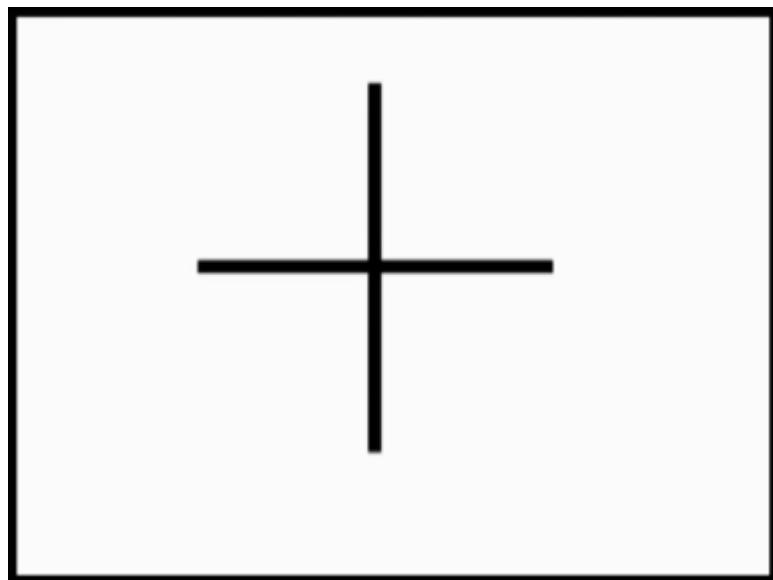
You look at this now famous visual icon. Now this is a logo of WWF. If you visit their site you see this image. Now you see here, here I am moving the cursor right now, you see WWF. Now you visit their site and you see exactly this very representation. Now when you actually see it you can very easily make out what you are looking at and you see it as panda because their gap that you see you try to know close it you try to fill it and therefore this is not no looked upon as you know some black filled areas against white background, but rather it is looked upon as an animal.

(Refer Slide Time: 13:08)



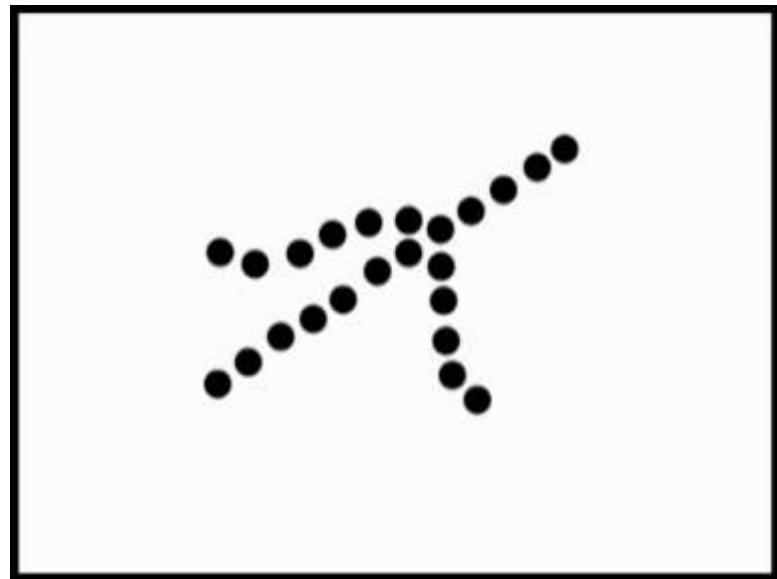
We come to the next law that is the law of Continuity. Law of continuity basically says that continuous figures are always preferred. Now till now we were repeatedly taking examples of circles, now let us take example of straight lines and then we will look at one of the events from Beijing Olympics to understand law of continuity. The law of continuity says that the continuous figures are preferred by us. So, something that runs in continuation.

(Refer Slide Time: 13:40)



You can see a bold straight line entering from the left side of the screen. Now another one enters from the right side. Although they are two separate lines as you initially saw, but when they join, you see them as one straight line. When two more straight lines enter from top and bottom respectively, you perceive an x-y coordinate. When two of these lines become red, green, blue or yellow they are perceived as one continuous figure. When they are all back you perceive them as x-y coordinate.

(Refer Slide Time: 14:21)



Let us look at another example of law of continuity; here you see dark black circles appearing on the screen. These circles are perceived as collective unit because they share a common feature of direction. Now initially use look at it as straight line and the movement is now the other line, the curve one comes there, you perceive it differently. You see as if it represents some type of direction.

(Refer Slide Time: 14:48)



If you visit now Indigo Airline, this is one of the airlines that you must have certainly seen here. When you look at their logo, actually you see what now you saw here. Now

when you look here, now look at your screen this very part where I am moving the curser. You actually see this law of continuity. This image although this is a collection of dots something that you saw right now in this animation, but the movement you see here now it gives a direction and it now makes you feel and fine, you are actually looking at something usual representation of airline.

(Refer Slide Time: 15:31)



Now, let us look at this video you see have the law of continuation working.

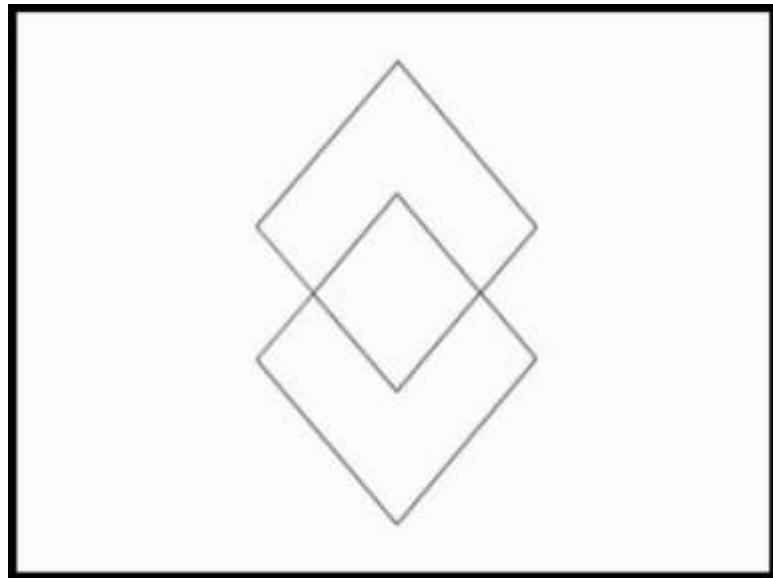
(Refer Slide Time: 16:05)

Gestalt Principles

- Law of Symmetry: Symmetrical objects are collectively perceived.
- Example of square and then example of a logo

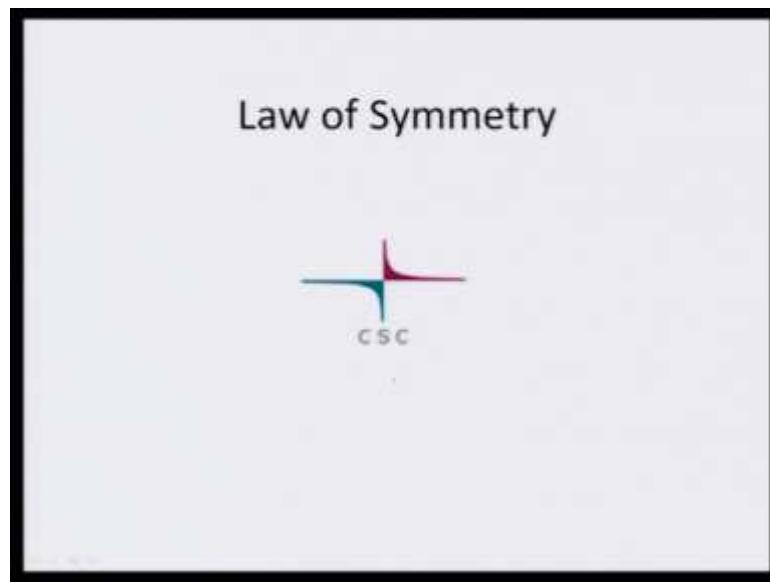
The next gestalt principle is law of Symmetry. We have been talking about symmetrical objects now, right from we began with our discussion on Pragnanz. Now law of symmetry says that symmetrical objects they will always be collectively perceived. Let us take the example of these squares and then we will also move to an example taking again a logo into account.

(Refer Slide Time: 16:30)



Look at this sky blue square and the blue square dropping out of it. This overlap helps you see another square. Let us look at these squares without any color. We will perceive them as two squares. When the top and the bottom parts are removed we clearly see a small square, but when they are brought back, we perceive two big squares overlaying each other. This demonstrates that in spite of distance symmetrical objects are collectively perceived.

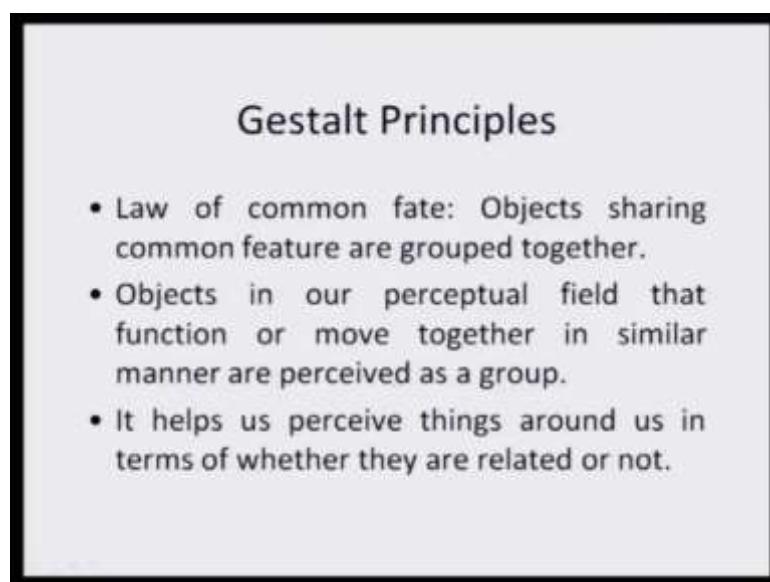
(Refer Slide Time: 17:05)



This is the logo of CSC which basically shows you how beautifully the law of symmetry can be used to, represent usually, represent one of the forms.

The next law of gestalt principle is the Law of Common fate. Law of common fate says that objects which share common features, they are grouped together.

(Refer Slide Time: 17:23)



So objects in our perceptual field that function or move together in similar manner, they will always be perceived together. Now what is the important of this very law basically it helps us perceive things around us in terms of whether they are related or not.

(Refer Slide Time: 17:51)



You must have seen these beautiful images in our Republic Day Parade. Look at this very video, which basically tells you, when different aircrafts which you basically know that these are different aircrafts but when they make a formation, they are then perceived together because they perform similar function, they move together and therefore, even though they are separate aircrafts they are not viewed so.

(Refer Slide Time: 18:20)



(Refer Slide Time: 19:50)

Attention

- Selection of certain inputs and retaining them in the conscious experience.
- In this process our field of experience is divided into focus and margin.

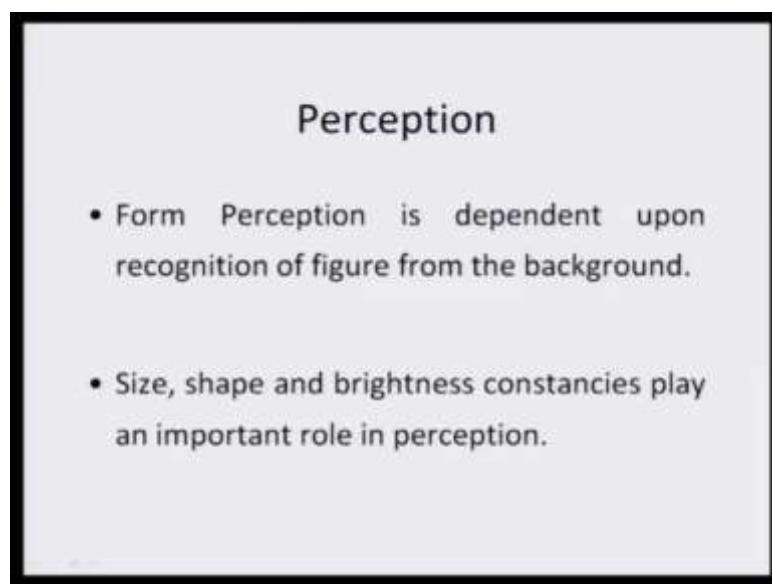
Now, given the fact that based on the quality of their stimuli, based on our individual preparedness and preferences and also based on the laws that govern our perceptual principles, we provide meaning to what we have sensed from the world. Now based on what we have sensed from world and depending on the appropriateness of the meaning that we have provided ,we many a times tend to select certain inputs and retain them in our conscious experience for little longer period of time. So, what we do, we tend to divide things into what would be in our focus and what we would now keep it on the margin. This is what is called as Attention. Because we have limited duration assigned for this very course. So, we would not go into the details of attention, but I must tell you that in the recommended book if you go through that you will find whole end up description of the process related to attention.

Introduction to Psychology
Prof. Braj Bhushan
Department of Humanities and Social Sciences
Indian Institute of Technology, Kanpur

Lecture - 09
Perception: Form Perception

Now, let us talk about Form Perception. Now, Form Perception basically is dependent upon reorganization of figure from the background.

(Refer Slide Time: 00:24)



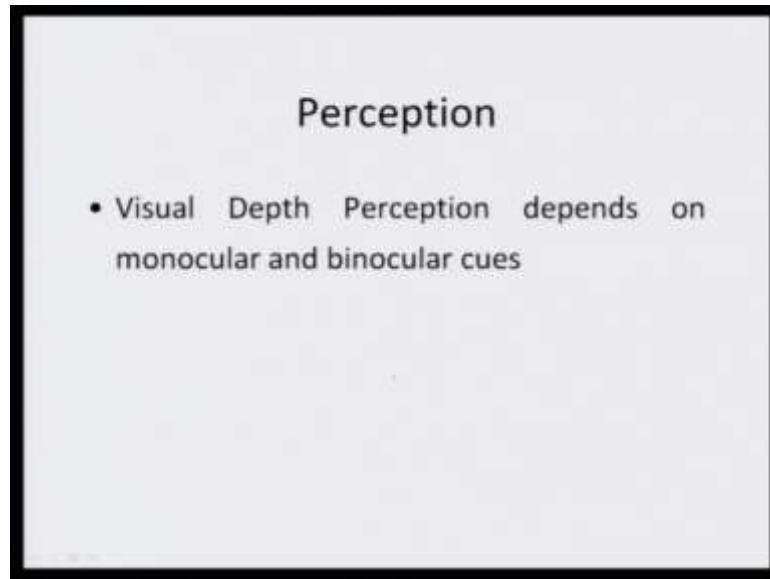
Perception

- Form Perception is dependent upon recognition of figure from the background.
- Size, shape and brightness constancies play an important role in perception.

And this basically would mean that certain type of constancies will work – size, shape and brightness. That would mean we would come through it in few seconds from now, that depending on the situation the size of the object might change, the shape of the object might change, the brightness, the contrast, effect might change, but then we have a tendency as human being to maintain mentally degree of constancy in terms of shape, size and brightness and that helps us perceive situation much better.

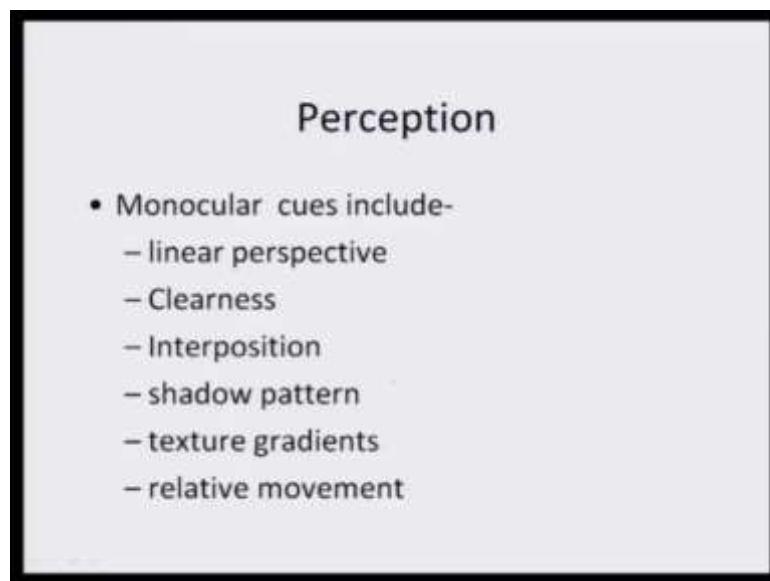
Now, in terms of depth, in terms of height, we always have the monocular and the binocular cues inputs coming from only one eye is the monocular cue and input that comes from both the eyes they constitute the binocular cues.

(Refer Slide Time: 01:10)



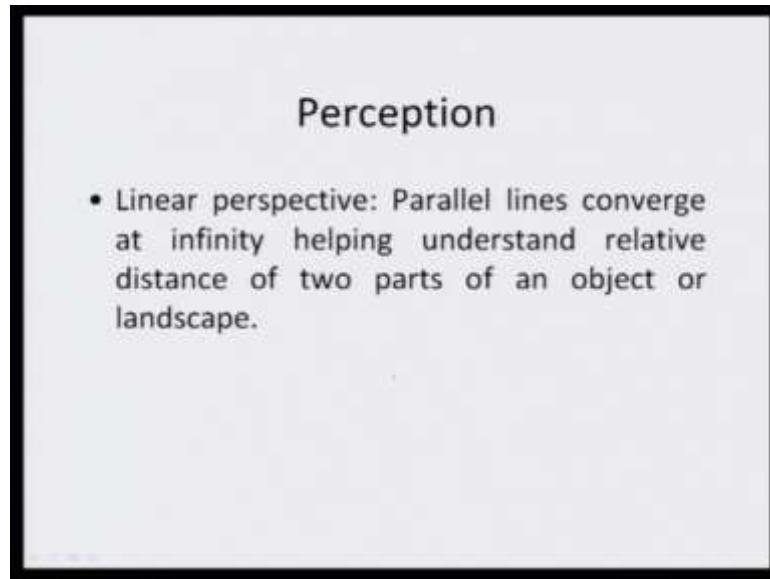
Now monocular cues they basically depends on linear perspective, clarity, interposition, the pattern of shadow, texture and the relative motion.

(Refer Slide Time: 01:24)



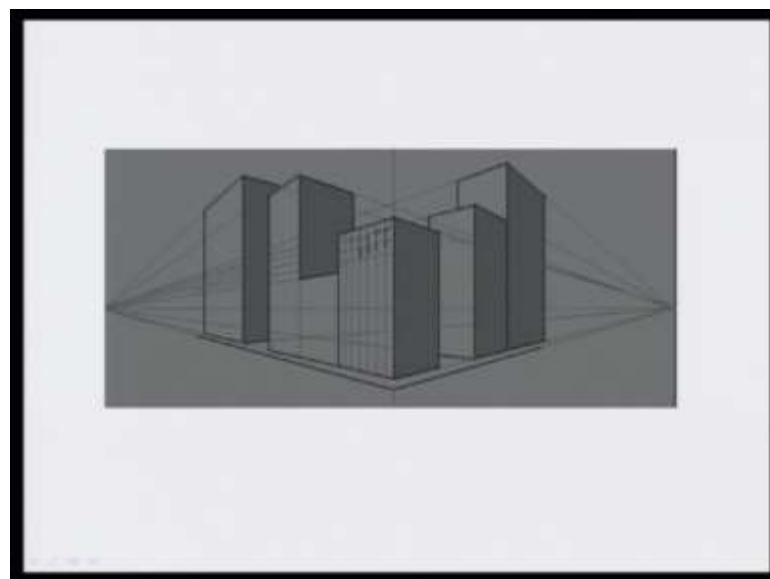
What we would do now is that all these 6 important ingredients of monocular cues; we will talk to them one by one, trying to take possibly the best example.

(Refer Slide Time: 01:50)



So, let us come to Linear Perspective when parallel lines they converge at infinity they help us understand the relative distance of two parts of an object or they even help us understand the whole landscape. Look at now this very image.

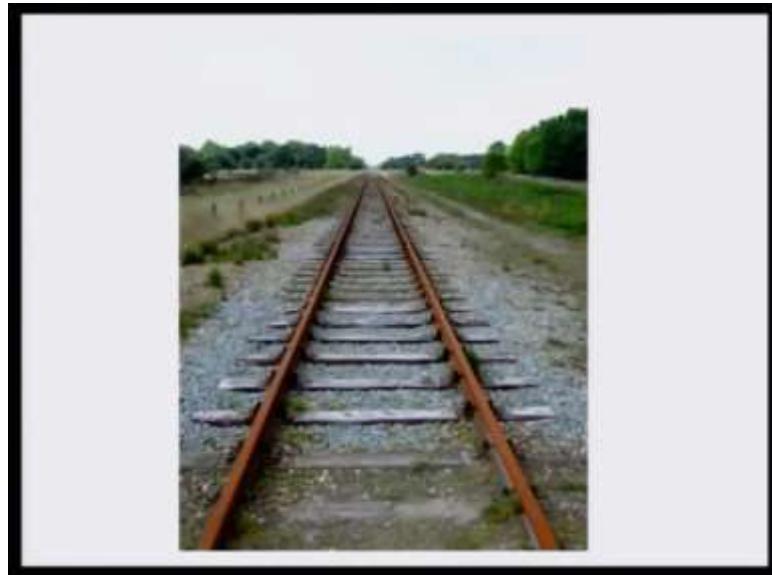
(Refer Slide Time: 02:05)



Now imagine the point where now the straight lines converge, you are standing at that very point and you are looking at the urban landscape this is what is the meant by linear perspective. So, what actually happens you have the convergence of the lines and this convergence of the lines helps you understand your position and the position of the

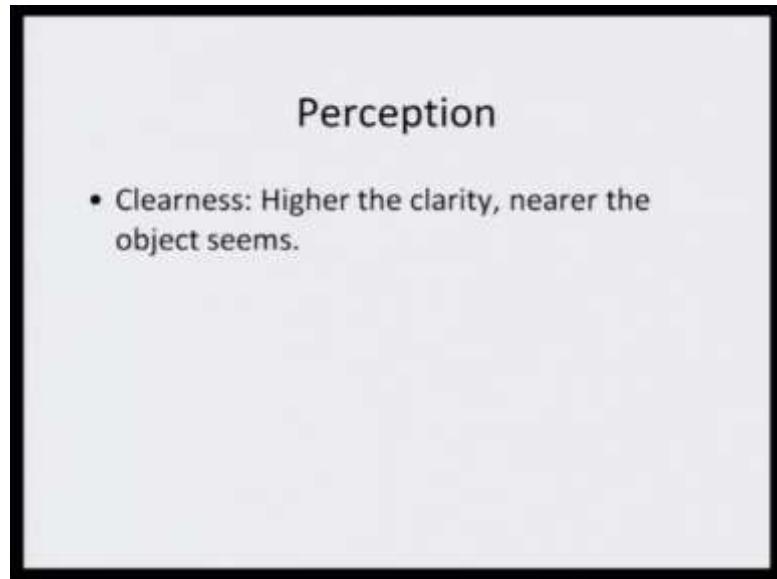
objects in your landscape and accordingly these monocular cues they help you understand the shape, the size and of course, depending on brightness and contrast you even can make out about the distance of the object from yourself.

(Refer Slide Time: 02:48)



Now, look at this very image. Now this is a very usual railway track that we have been seeing right from our childhood days. Now what happens when you look at the two parallel bars, the two tracks you stand in the center then you realize that they are wide apart they are separated apart, but then when you look at it at a distance you gradually realize as if the distance between the parallel bars they somehow tend to converge, they tend to come closer to each other. Now based on the monocular cues what we have been saying is that when you look at the object where you are and whether the parallel lines they converge or not that decides what you are looking and how you perceive the world around you. The first was the example of the urban landscape; the second is the example of again a modern infrastructure that is a railway track.

(Refer Slide Time: 03:44)



Now, we come to Clarity. If you are looking at an external environment and the more and more clearer things are - you always tend to realize that those things are near to you, things which are very far off from you will compromise on the degree of clarity.

(Refer Slide Time: 04:07)



Look at this very image now and you compare both of them. The first is where you see the structure and you see the structure with much more clarity and you can sense that the object is much more nearer to you; the structure is much more nearer to you. In the other case of course, you realize that the clarity is compromised with and with the compromise

in the clarity you will realize that the image on the right tells you that the structure is nearer to you, the image on the left tells you that the that the structure is far off from you. So, in terms of monocular cues how clearer is the image that is generated that would tell you how far or how nearer you are to the object.

(Refer Slide Time: 05:00)

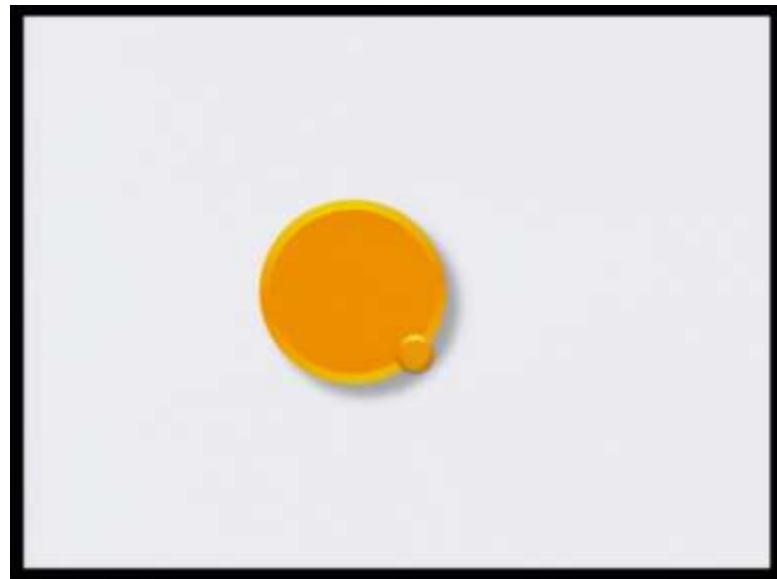
Perception

- Interposition: An object obstructing the view of another object seems nearer.

The third is the Interposition, Interposition is when you have two or more objects in the same visual field and one object obstructs the view of the other one.

Now, the object which looks very nearer to you would be the one which will block the clearer perception of object at the back.

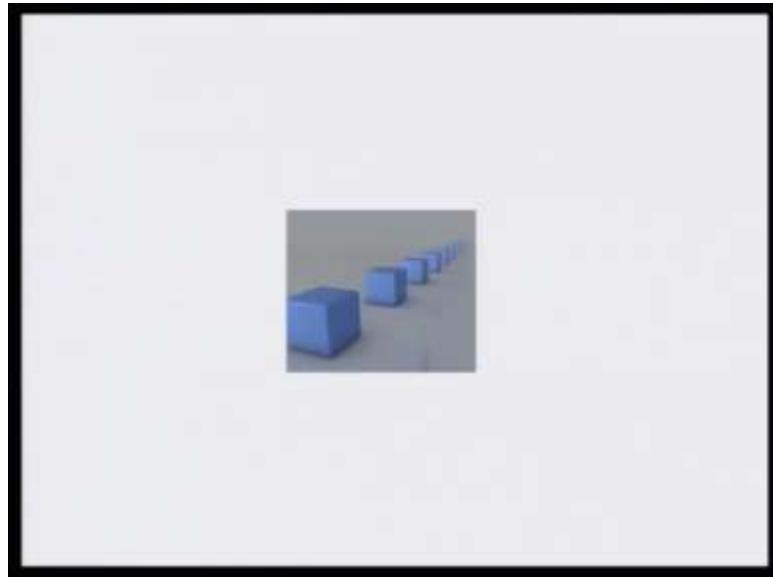
(Refer Slide Time: 05:11)



Now look at these two circles if I ask you how distant you are from these two circles it is very difficult for you, you will perhaps say that I am at an equidistance. Now look at the movement pattern, now if I ask you which is nearer to you, you can very easily say the one which is the smaller is nearer to me, why is it nearer to you? Because monocular cue tells you that this colored disk is nearer to you is the one which blocks a part of the disk which is at the back. That means, unless this very object will be now nearer to me it cannot now work as interference in a clearer perception of the object at the back. So, this is interposition. Now the position of the object which is nearer to you is also the one which blocks clear perception of the object at the back.

Same is the situation here.

(Refer Slide Time: 06:21)



Now, we come to the Shadow pattern.

(Refer Slide Time: 06:24)

Perception

- Shadow pattern: Luminance and contrast helps in depth perception.

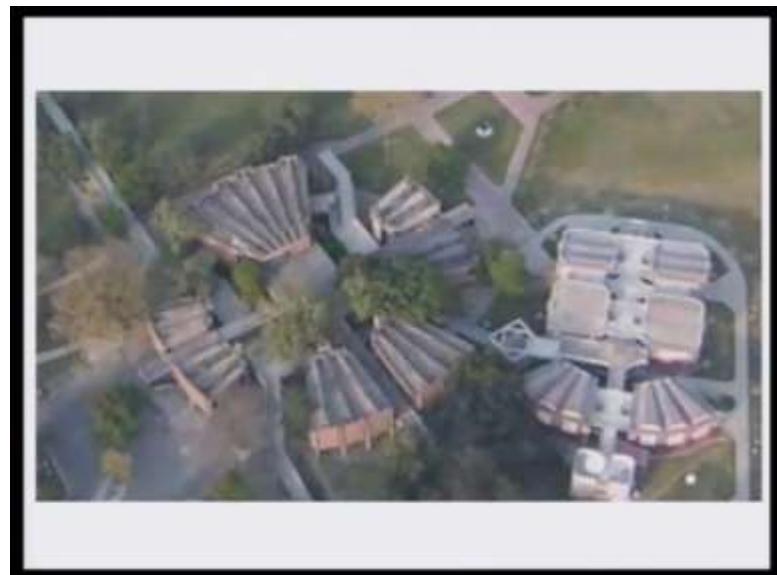
Shadow, you know wherever you have light you will always have shadow if an object is put there. So, luminance and contrast they help us understand the depth and because it helps us understand the depth. So, if you inverse the phenomena you can say that this also helps us understand the height of the object.

(Refer Slide Time: 06:51)



Now, look at this very video. This is the aerial image of IIT, Kanpur. Now this video did show you the aerial image of various structures of IIT, Kanpur campus.

(Refer Slide Time: 07:27)



And right now when you look at the lecture hall complex of the IIT Kanpur, because at a certain height you see that one structure creates or casts a shadow of a type; this change in the luminance pattern it tells you that find this object is little above the background and if it is above the background this means this would have particular height. So, it is basically the pattern of shadow, the luminance, the whiter area and the shadow the darker

area the contrasts that you are able to establish that will help you understand how high is the building that you saw right now when you were looking at the aerial view of IIT Kanpur campus.

(Refer Slide Time: 08:12)

Perception

- Texture gradients: A continuous change.
- Objects closer to you have coarse texture with details.
- With increasing distance texture becomes finer.

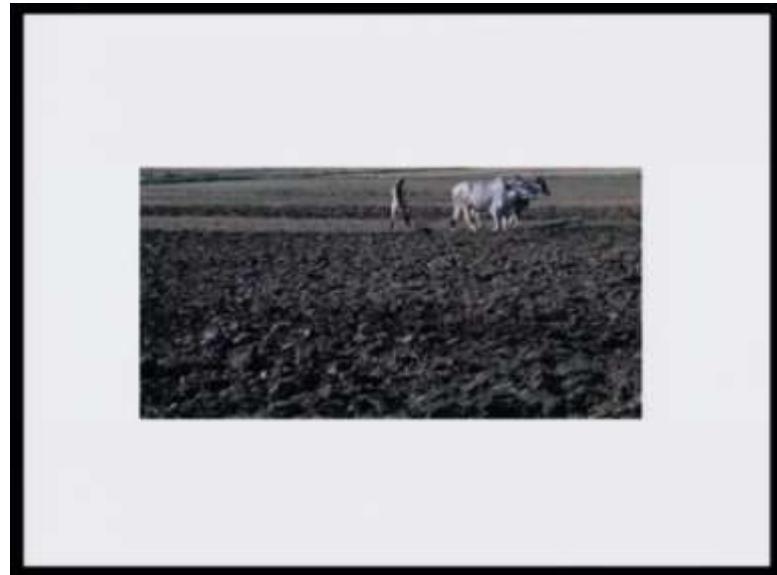
Another interesting feature that is part of the monocular cue that helps us understand the world is Texture gradient. Now texture gradient basically is supposed to have a continuous change, the objects which are closer to us will have a coarse texture with much more details and if the distance increases the texture becomes finer. Look at this very image now.

(Refer Slide Time: 08:40)



Now the object at the bottom if you look at it, it has much more clarity. The texture has all the coarse details and you can very easily say that this is nearer to me, whereas if you move upwards you realize that it is not so nearer to me, now the distance has increased a bit.

(Refer Slide Time: 09:03)



Look at this vary situation, you have a farmer ploughing the field and when you look at the pattern of soil there you would realize that things which are nearer to you if you are standing at the start of that very point, the starting point you realize that the coarse

texture is very very clearer to you. But when you move at a distance where the farmer and the bulls are you realize that it becomes more finer and this gives you a feel that well things which are nearer to me in terms of texture gradient, you would realize that things which are nearer will have much more coarse texture details. Whereas, things which are at distance there you do not have that, the texture does not have that coarse details and therefore, you realize that the texture becomes more and more finer.

(Refer Slide Time: 09:56)

Perception

- Relative movement: During movement, objects in the visual field move relative to the person as well as to one another.
- Objects near to you move in opposite direction.

We now come to relative movement. Now movement you all understand relative movement basically means that during movement when you look at objects in the visual field, you look at your position and the relative position of other things in the environment. Now look at this very video.

(Refer Slide Time: 10:21)



Here you have the iron bars and the vertical bar which is too close to the car to the one who is looking at another objects that are nearer and far off, you find that they seem to cross you very fast compared to you now the objects the field and the objects in the field and the background where you see the hill and the trees. All of these vertical iron bars seem to cross much faster, whereas the remaining part of the back ground seems as if they move very very slow. So, this is what was being explained right now.

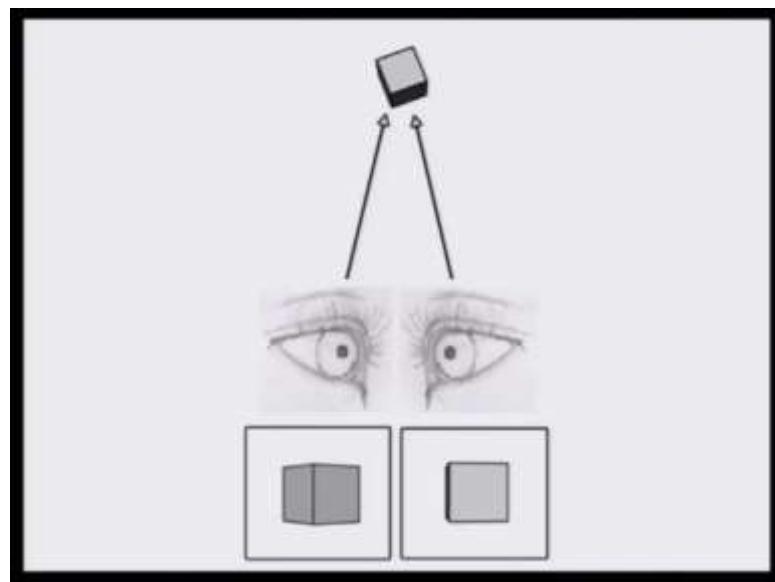
(Refer Slide Time: 10:59)

Perception

- Binocular cues
- The image of an object in the two eyes are not exactly the same.
 - retinal disparity

Having discussed monocular cues let us now look at the binocular cues. Now a binocular cue basically is a situation where cues come from both the eyes. So, the image of an object now that falls on both the eyes the left and the right eyes they are not the same. You remember right on the very first day when we were looking at the visual pathway, even there when the child was looking at the colored disk the two hemispheres of the brain did not have the full representation of the colored disk, there was a division left right division. So, that clearly means that right from the level of the eye till the level of the brain the signal that goes to the left side of the eye and the brain is not equivalent to the signal that goes to the right eye and the right side of the brain, the right hemisphere. And because the image of the object that falls on the two eyes they are not the same it creates certain degree of disparity and this is called as the retinal disparity because there is a disparity at the level of retina the image that is generated on the retina.

(Refer Slide Time: 12:08)



So, if you are looking at a cube you can sense, right now on the top you have the cube the left and the right eyes and what the left and the right retina creates the image of that cube you can see line sketch demonstrating it, this is what is meant by retinal disparity.

(Refer Slide Time: 12:26)

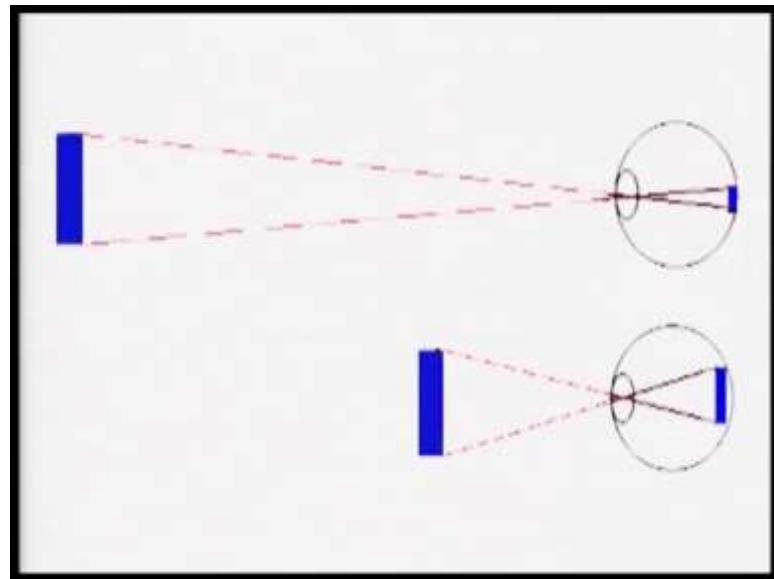
Perceptual Constancy

- Size constancy: Object is perceived to have the same size irrespective of change of distance, rotation, perspective, and so forth.
- With increase in distance, the size of image on the retina reduces.

Now, despite this retinal disparity what is very interesting is that we do have the ability as a human being to maintain certain degree of perceptual constancy. Constancy in terms of size of the object, constancy in terms of shape of the object, and constancy also in terms of brightness of the object, and this helps us commit less and less number of errors even though things are dynamic in our world. So, let us first look at size constancy.

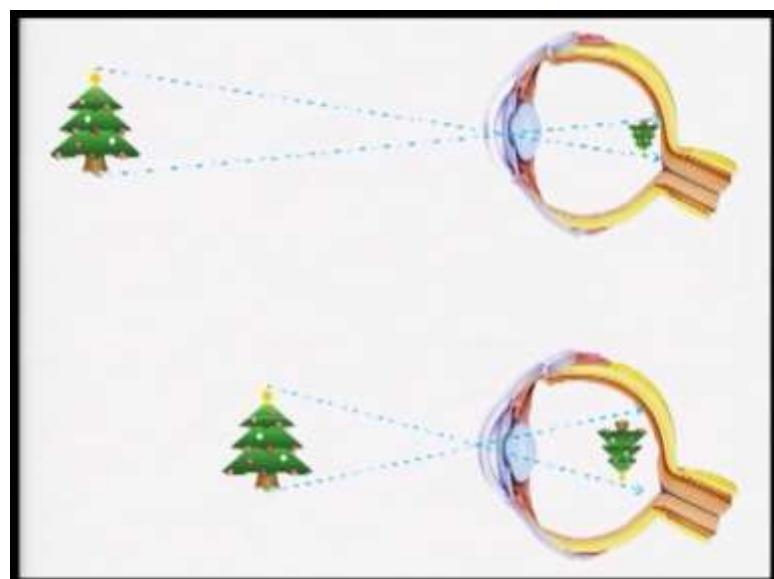
Now, objects are perceived to have same size irrespective of the change in distance, rotation and perspective. So, with increase in distance the size of the image on retina reduces.

(Refer Slide Time: 13:14)



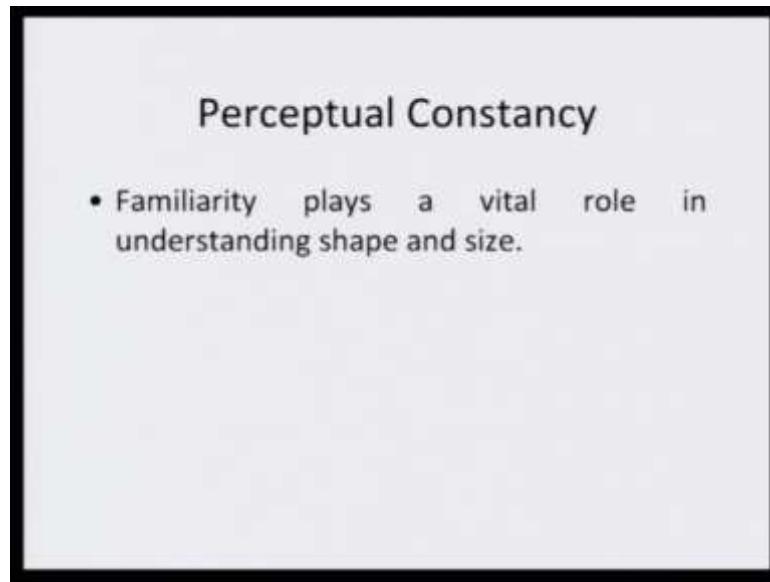
With increase in distance the size of image on the retina always reduces. So, you can see here the two objects that you see now they are of the same size, the blue blocks that you see on your screen they are of the same size, but when the image gets casted on the retina you see a change. For blue block which is far off from you from the eye here shown on the top you find it that the image that is generated on the retina is smaller compared to the image of the object that is very near to you.

(Refer Slide Time: 13:49)



So, nearer objects will have bigger images on the retina, far off objects will always have a shorter image on the retina, but then the beauty of human perception is that we still maintain the size of the objects that we see and remember this will be always be true for familiar objects, if you are not familiar with the object, if you have never seen this object this is a novel thing for you then, you will get rid of this size constancy.

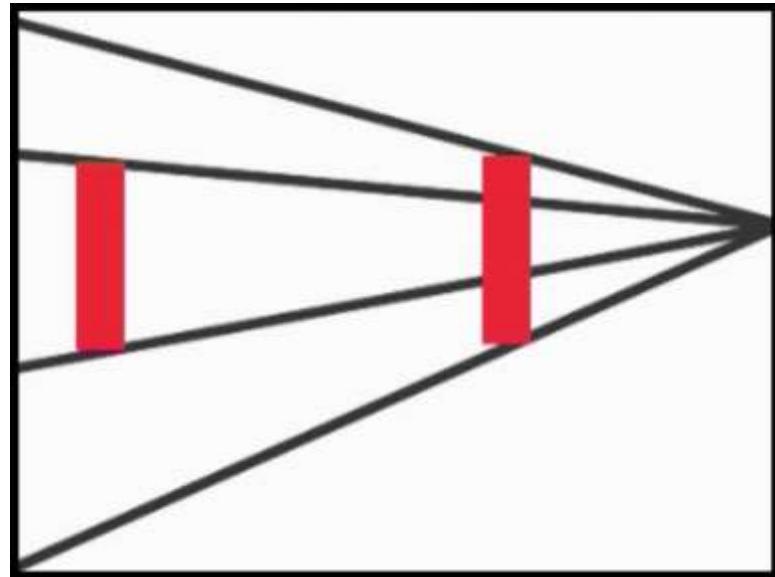
(Refer Slide Time: 14:16)



Now, in terms of perceptual constancy familiarity plays a very very important role. So, if you are familiar with an object you know what would be the shape and size of this very object and therefore, despite the fact that in reality the shape and the size varies you always maintain a constant shape of that very object.

Look at this video now. You will find how the shape changes, how from the varying distance the entire thing that is actually available now that you are eyes sees changes, but then in our real life we do not consider these changes to be significant and therefore, we always maintain the size constancy.

(Refer Slide Time: 15:33)



Look at your screen now you see a red bar. Now another red bar has come exactly out of this earlier one, both bars are of the same size the moment you put these lines now. The right red bar which is close to this line of convergence of the black ones seems bigger compared to the red bar which is on the extreme left hand side. Now in reality although we know, right now we have seen now that these two bars are of the same size if you replay it this is what you saw both bars are of the same size, but then the moment now you add the perspective here you realize now that they are not the same. Let us take another example.

(Refer Slide Time: 16:25)



Look at the human sketch here and you again just like the red bar here the same image is taken out, but the moment you have the added background there you realize now with respect to the perspective that the man running in the front seems to be smaller compared to the man at the back. So, this is now the interesting dynamics of understanding the whole process. Familiarity plays a vital role in understanding the shape and the size.

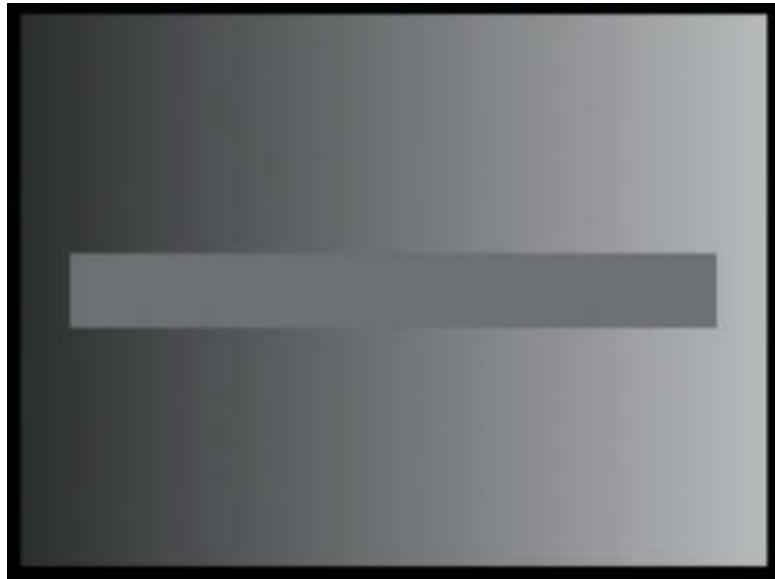
(Refer Slide Time: 17:19)

Perceptual Constancy

- Brightness constancy: Whiteness, grayness, and blackness appears constant despite variation in the reflected physical energy from the object.
- Coal looks black in bright sunlight; snow looks white at night.

We now come to brightness constancy. Now whiteness, grayness and blackness they appear constant despite variation in the reflected physical energy from the object, this is an interesting truth of the world and therefore, when you look at coal which is black in a bright sun it looks more black compared to when the light is dim. And similarly if you look at snow in the night hours it looks much more white compared to daylight condition this is the truth, but when we look at coal and snow or for that matter any object which is you are familiar with we tend to maintain constancy in terms of whiteness, grayness and the blackness of that very object.

(Refer Slide Time: 18:07)



Now, look at this various strip if I ask you what color do you see here on the center of the screen and you will say gray if I ask you is this a uniform pattern, answer is likely to be yes. Now if I change the background, now look at this background now suddenly you realize that the spread of gray is not uniform across this screen and this is not uniform because the background has changed. Similar example was being coated right now, that the coal is black, but the coal is far more black if the you look at it in a bright sunlight condition and similarly snow is little more white if you look at it in a dark condition.

(Refer Slide Time: 18:53)



Now, look at these two colored circles if I ask you what is the color of these two circles and you say this is gray, exactly like the strip that you saw. Now the moment I change the background and I change the brightness level now, the whiteness, the grayness and the blackness has been tampered with and this gives you a feel as if this you are looking at a three dimensional object. Remember this screen is two dimensional, the sketch is two dimensional, our retina gets a two dimensional image, but when we mentally construe it we perceive as if we are looking at the third dimension as well.

Designers, all artists, they create similar type of situations to give you a feel of depth and height. You just see here on the figure on the left you can have a depth perception, you feel as if now piece has been taken out of it, a cavity is there, on the other side you see a bump - one that gives you the feel of depth the other which gives you feel of height. So, this is now depth perception and height perception which basically depends on the whiteness, grayness and the blackness in the situation. Remember one thing that this has been deliberately done, if this is not done then we as human beings have a tendency to maintain constancy and therefore, irrespective of change in the degree of light emitted back from the object we try to maintain constancy. Things which are brighter to us will always remain brighter things which are darker to us will always remain darker and that does not allow us to commit big blunders.

(Refer Slide Time: 20:47)

Perceptual Constancy

- Shape constancy: Irrespective of the change in slant or orientation of the object, invariance in the perception of shape of the object.
- Movement of performer during gymnastics

Similarly, the third constancy which is again important is constancy in terms of shape. Now irrespective of the change in slant or orientation of the object, we always perceive them to be of the same size. So, if I take an object in my hand for instance I take this object in my hand the size that you see right now the moment I change the slant the size, the shape will not remain the same.

(Refer Slide Time: 21:03)



But then as human beings what we do is we know that this is the actual size of the object, a cell phone will be of this dimension the length, the width, the thickness and that is it.

Now, you keep on changing the slant, you keep changing the orientation, the mobile phone will remain mobile phone. The visual perception will not vary. The best example of this is when you look at the field of sports, when you look at the movement of a performer during gymnastics his body position constantly changes at a very fast pace, the slant, the orientation, everything changes, but then you know that this athlete is say for instance 5 feet 7 inches tall that's it. The shape and the size constancy will be maintained. Look at this very video, these are some of the finest movements that human beings are capable of performing, all these requires extreme degree of coordination.

Key words - perception, monocular cues, binocular cues, perceptual constancy

Introduction to Psychology
Prof. Braj Bhushan
Department of Humanities and Social Sciences
Indian Institute of Technology, Kanpur

Lecture - 10
Perception Role of Culture in Perception

Till now we have been talking more with the respective to the external environment. We have not yet known gone to the cultural aspect. So, now, let us talk about the role of culture in perception.

(Refer Slide Time: 00:36)

Culture & Perception

- There are cultural differences in colour naming.
- This difference is based on physiological difference in colour vision.

So, we would be now factoring in the cultural factors, very interestingly you would realize that there are cultural differences even in terms of giving name to certain colors, and this difference is based on the physiological difference in terms of color vision.

Now, look at the visual spectrum, you are looking at the visual spectrum, you can clearly see the blue and the red ends of this spectrum, but this is not true for every culture.

(Refer Slide Time: 01:05)

Culture & Perception

- Some languages spoken in cultures near to the equator fail naming colours at the blue end of the spectrum.
- Green & blue, blue & black, or green, blue and black are not given different names.

Be surprised to know that some languages which are spoken in culture in near to the equator, they fail naming colors at the blue end of the spectrum, the green and blue, blue and black or green blue and black, usually they are not given different names in culture near to the equator and this is an interesting dimension no? So, depending on where exactly you are placed on the globe and the cultural context to which you belong to the perception changes. Now physiologically these people they have increased inter ocular yellow pigmentation and this leads to decreased sensitivity for the blue end of the spectrum, reason is physiological here.

(Refer Slide Time: 01:44)

Culture & Perception

- Physiologically, these people have increased interocular yellow pigmentation and this leads to decreased sensitivity for the blue end of the spectrum.

(Refer Slide Time: 01:53)

Pictorial Perception

- In pictures, the three-dimensional world is represented in two-dimensions.
- Members of different cultures perceive pictures differently.
- For example, African tribal children and adults have been found to have difficulty in depth perception in the pictures.

Now, in pictures, the 3 dimensional worlds is represented in 2 dimensions. Now members of different culture they perceive pictures differently, for instance African tribal children and adults have been found to have difficulty in depth perception in pictures.

(Refer Slide Time: 02:13)

Pictorial Perception

- The accuracy of pictorial perception depends upon the identification of the depicted objects as well as the spatial and dynamic relations among the objects.

The accuracy of pictorial perception depends on the identification of the depicted object as well as the spatial and dynamic relation among the objects. Many a times, we fail to provide exact meaning to what we sense, and such distortions are called illusions.

(Refer Slide Time: 02:26)

Visual Illusions

- Many times we fail to provide exact meaning to what we sense.
- Such distortions are called illusions.
- Although illusions might occur with several senses, visual illusions are too common.

In case of perception, sensation is complete, we assign appropriate meaning and then we say that because the meaning is appropriate therefore it is perception, if we commit error in that sense then it is called illusion.

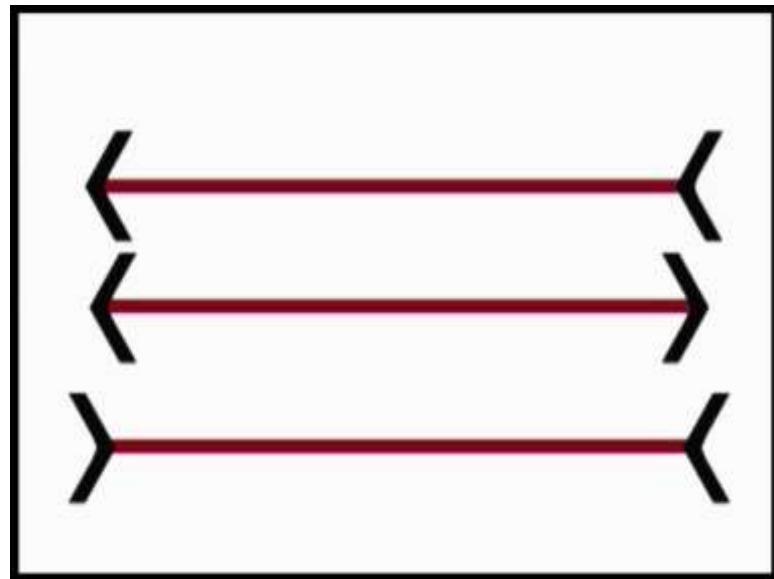
(Refer Slide Time: 02:56)

Müller-Lyer Illusion

- The length of feather-headed segment is overestimated as compared to the length of arrow-headed segment.

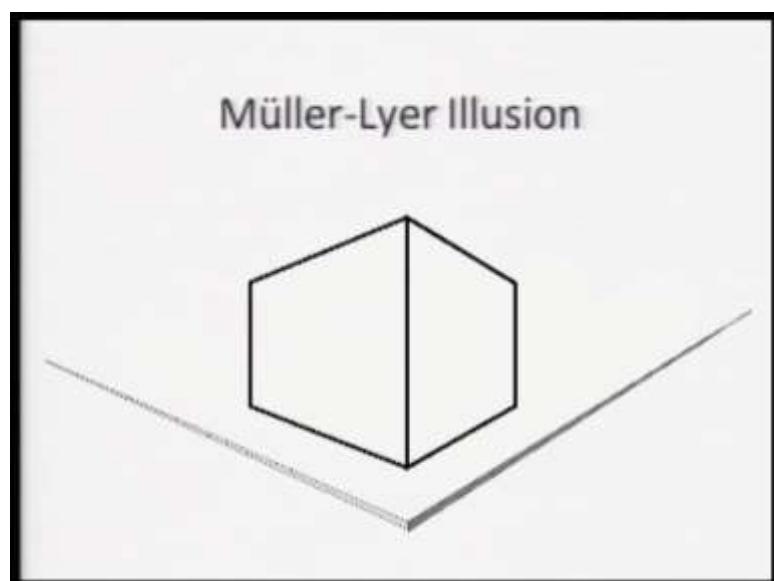
Now although illusions might occur with several senses, visual illusions are most common and the most common of the illusion is what is called as Muller Lyer Illusion. Here the length of feather headed segment is overestimated as compared to the length of the arrow headed segment.

(Refer Slide Time: 03:10)



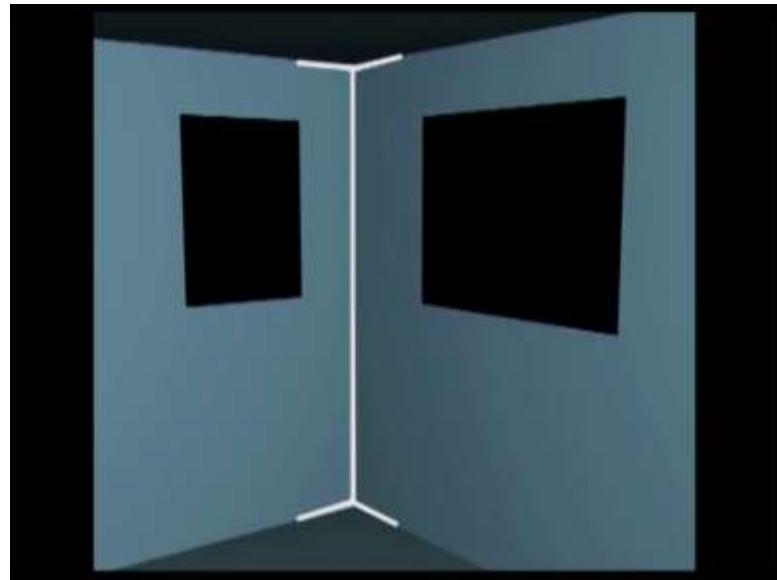
Look at this straight line the left side of the line has now become arrow headed where as the right side has become feather headed, are they equal? Let us look at it little differently this is an arrow headed line, another line drops down from it and becomes double arrow headed line, now a third line drops down and become a feather headed line are they equal? You know that the answer is yes, but when you look at them the third line which is feather headed line seems bigger, the arrow headed line on the top looks smaller compared to this feather headed line and this is called Muller Lyer Illusion.

(Refer Slide Time: 03:53)



Now, where do we actually have Muller Lyer Illusion in our real life? Imagine you are walking on the pavement you are crossing straight, you take a turn the building that you see on the corner you see a building on the corner here. Now you can very easily see this Muller Lyer Illusion. So, some part of the building looks to you as if it has an arrow headed line.

(Refer Slide Time: 04:27)



Have a look at this; you now see the arrow headed line. Now if you just try to move in, what will happen? Let us have a look at it. Now, you are inside the room and what you are actually looking at is, as an arrow headed line now seems as a feather headed line and this is known; Muller Lyer Illusion. We all know that the size of the 2 walls are the same, but then depending on from which side you are looking at that agent once you have the you feel it this is taller and other case you considered this is smaller and in all the cases you know always have this Muller Lyer Illusion.

Now, that we have understood now that the length of the arrow headed line and the length of the feather headed line, they are not perceived equal, what has been realized is that the magnitude of Muller Lyer Illusion it decreases with age, studies show that a comparison among Eastern, Western and Southern African, Philippines and United States, when people from these areas are taken from these areas the studies show that Muller Lyer Illusion was greater for children and it was not greater for adults.

Now, cultural difference with the respect to susceptibility of illusion is very interesting. One of the study show that the magnitude of Muller Lyer Illusion in the residence of Papua and Great Britain and what they found as that although both groups had illusion the magnitude of Muller Lyer Illusion was higher among the British subject. So, people who are exposed to them urban modern lifestyle they had more of this Muller Lyer Illusion. The earlier comparison among Eastern, Western and Southern African Philippines and United States that we had seen right now, showed that the Muller Lyer Illusion was higher in American and South African Europeans as compared to the non western participants in this very study. This was the study by Segal and his collaborators.

Another type of illusion is Ponzo illusion. Ponzo illusion is a case where, the length of the upper horizontal line is over estimated as compared to the lower horizontal line. We saw the example of railway track not at with the respect to perspective.

(Refer Slide Time: 07:06)

Ponzo Illusion

- The length of upper horizontal line is overestimated as compared to the lower horizontal line.

Right now we are trying to understand it in terms of Ponzo illusion. Let us take example of Ponzo illusion, now in case of Ponzo illusion the length of the upper horizontal line is overestimated when one compares it with the lower horizontal line, we have taking the example of the railway track in the past.

(Refer Slide Time: 07:20)



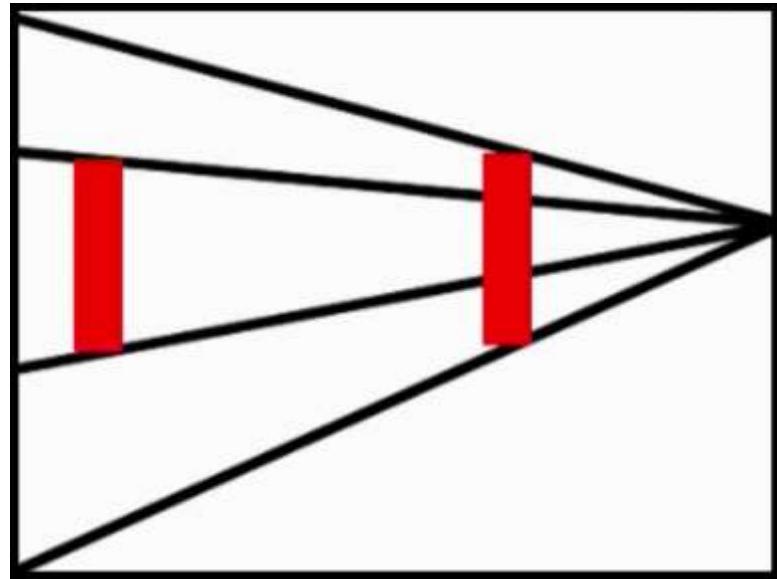
So, when you look at the slippers that connects the 2 tracks you realized that the slippers which are nearer to you and the slippers that are at a distance they are not considered as having the same length.

(Refer Slide Time: 07:41)



When you look at the parallel line stretching across the buildings here it seems that it is wider in the beginning and gradually it becomes narrow.

(Refer Slide Time: 07:54)



Let us take another example, you see a bold red line here, another line same size comes out of it, but when you look at them after the black lines have been drawn the red line on the right seems bigger than the one on the left. If you consider yourself standing at the point where all the black lines originates, then the red bar nearer to you will look bigger as compared to the one which is at a distance.

Look at another example here if you replace the lines with human beings you will still perceive the same here you see that the 2 human figures are actually replica and hence are of the same size, but the moment context is added one becomes bigger compared to the other one. Now with the respect to the magnitude of Ponzo illusion it has been realized that with increase in age the magnitude of Ponzo illusion also increases.

(Refer Slide Time: 08:41)

Ponzo Illusion

- The magnitude of Ponzo illusion increases with age.

(Refer Slide Time: 08:53)

Ponzo Illusion

- Context containing distance information-
- A figure representing Ponzo illusion was superimposed on a photograph of a field.
- The uneducated Ugandan village residents did not have any illusion.
- The magnitude of illusion increased in Ugandan and American college students.

Now, context that contains the distance information is of importance, a figure representing Ponzo illusion was superimposed by one of the researcher on a photograph of a field.

Now, the uneducated Ugandan village residence they did not have any illusion, that horizontal vertical illusion where as the magnitude of the illusion increased in the Ugandan and American college going students.

(Refer Slide Time: 09:34)

Horizontal-Vertical Illusion

- Overestimation of the vertical line with respect to the horizontal line.

Now this basically means that the cultural context in which you have been living that affects the degree of illusion that one would experience. Now horizontal vertical illusion if you look at there is always the overestimation of the vertical line with the respect to the horizontal line.

(Refer Slide Time: 09:40)

Horizontal-Vertical Illusion

- In horizontal-vertical illusion, the vertical line is perceived extending away from the viewer.
- Rather than rectangular shapes, the open vistas in the environment is pertinent for this illusion.

In horizontal-vertical illusion, the vertical line is perceived extending away from the viewer rather than rectangular shapes, the open vistas in the environment are pertinent for this illusion the horizontal vertical illusion.

(Refer Slide Time: 09:56)

Trapezoidal Window Illusion

- When you look at the window of a house from a certain angle, it looks like a trapezoid.



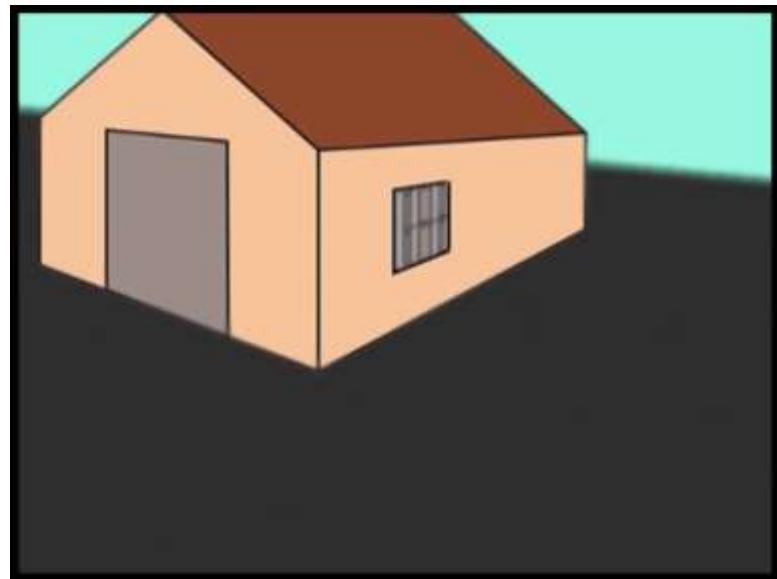
Now, take this very example of trapezoidal window when you look at the window of a house from a certain angle it is specifically looks like a trapezoid.

(Refer Slide Time: 10:12)

Trapezoidal Window Illusion

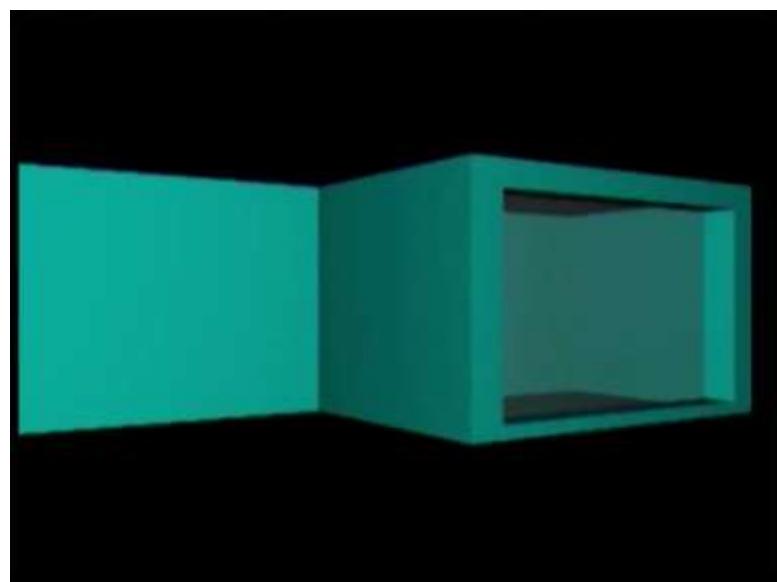
- A rotating trapezoid window is perceived as an oscillating window.

(Refer Slide Time: 10:16)



Now, a rotating trapezoid window is perceived as if it is oscillating. So, the window looks like oscillating window. Right now you saw a house and then you had a just rectangular window there, to give you sense that fine, from particulars orientation when you look at the house, look at the walls of it, the window that it has which is actually rectangular you precede that it is trapezoid. Now look at this very animation.

(Refer Slide Time: 10:40)



Now, instead of rotating window that you saw in the previous animation see the animation here it is of course, full window only that gets projected here and then you

have a rotating window. The interesting part in trapezoidal window illusion is that the moment know you start focusing on this rotating trapezoid, it actually starts giving a feel that it is oscillating.

(Refer Slide Time: 11:19)

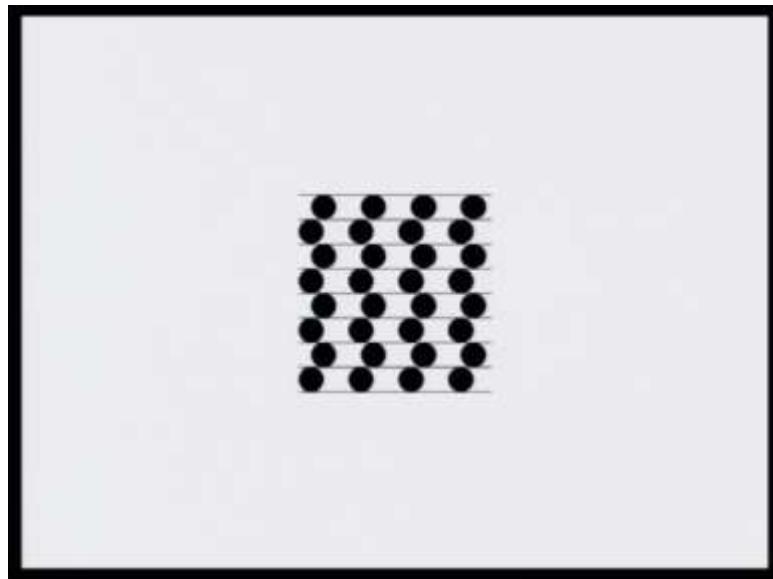
Zulu Children Study

- Rural Zulu (in Natal) setting contains very few rectangular objects.
- Zulu language has absence of words for window, square, or rectangle.

This is now called at trapezoidal window illusion. It is very interesting to know perhaps that the rural Zulu setup; they contain very few rectangular objects. So, their environment does not have too many rectangular objects and therefore, if you look at the Zulu language also, it has absence of words for windows squares or rectangles these words are not there.

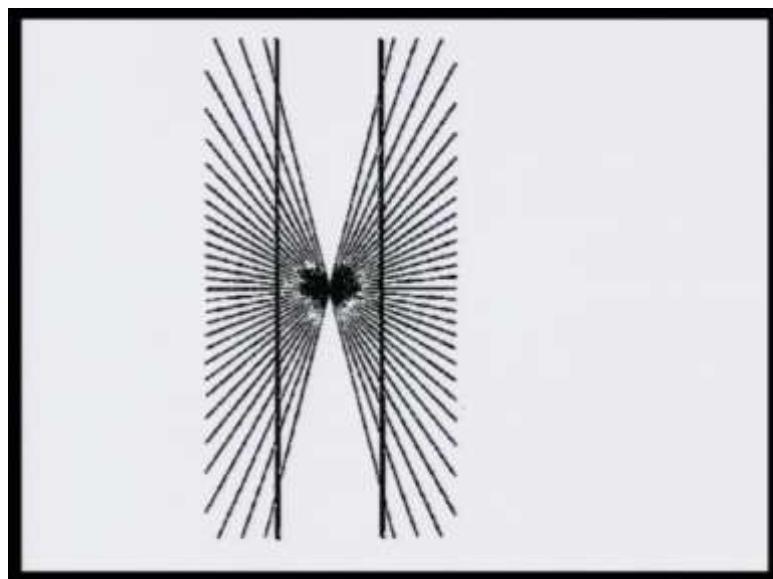
Now, in an interesting study, a comparison was done of rural and the urban Zulu children. The rural Zulu children had less illusion compared to their urban counterparts to the level of 60 percent know and most rural Zulu children did not report any illusion. Now if you do not have rectangular objects in your environment, if you do not have words representing them, you also do not have the degree of illusion. So, that is an interesting what you call effect of culture on illusions.

(Refer Slide Time: 12:16)



Now, look at these very lines, all these lines looks as if they are very straight lines and they are parallel to each other the moment you insert colored circles here

(Refer Slide Time: 12:37)



now the line does not look as if it is straight know it looks as if it is bent between 2 black spots. Similarly two vertical lines and the moment you had the lines starting at a common originate, you realized that the two vertical lines it seems as if they are not straight but they are rather bent at the center. So, these are very typical type of visual illusions that we all experienced.

(Refer Slide Time: 12:56)

Perceptual Constancy

- West African adults demonstrated greater shape and size constancy as compared to the British adults.
- African culture provide few opportunities to learn geometric forms.
- Bantu language lacked words allowing clear shape distinctions.

Now, West African adults they demonstrated greater shape and size constancy in one of the studies as compared to the British adults and African culture basically provide few opportunities to learn the geometric forms. The bantu language one of the language spoken in that very area of the world, lacked words allowing clear shape distinctions and that is considered as one of the important factors that influences visual perception especially optical illusion, when it comes to defining the meaning of the external word and then you realize that the cultural factors they play extremely important role there.

(Refer Slide Time: 13:54)

Spatial Orientation

- Spatial orientations such as left-right, up-down assume more significance in some cultures.
- Geographic features such as mountains and shores affect local reference systems. This, in turn, affects perception of spatial orientation.

Now, having talked about these many issues in perception now that we are know towards the end of our discussion on perception, let us talk about the importance of spatial orientation. Now spatial orientation, such as left right or up down ha has it is own importance in certain cultures. So, for instance there are certain type of rituals which are supposed to be performed only by the right hand, certain type of rituals which are supposed to you performed only with the left hand in certain cases know you are suppose to be on the left side in this face in some cases you are supposed to be on the right side of this face. So, it has it is own cultural importance.

(Refer Slide Time: 14:37)

Spatial Orientation

- Sailors navigation strategies
- Habits of local sea birds
- Change in colour of water
- Change in wave formation
- Feel of boat in a wave of a particular course
- Star patterns

Interestingly the geographic features now such as, mountains and shores they also affect our local reference system and this in turns affect our spatial orientation. Now importance of spatial orientation can be seen in especially in the sailors who are in the ocean and all they see on all their sides is only the blue water, nothing more than that. Now many of these sailors they uses specific navigation strategies for instance in certain locality in the oceans they look at the habit of the local seabirds, certain type of birds they are habits and it tells them where actually they are in the ocean. Many of the season sailors will also tell you that they look at the change in the color of the water and depending on the color of the water, they can very easily make out which ocean they are in especially when, they are supposed to move from one to the other .Many of them, the experts can even look at the pattern of the wave formation and looking at the wave they

can tell you that fine they are in this very ocean, Indian ocean or they are in pacific and so forth.

(Refer Slide Time: 15:44)

Motion Perception

- Perceived motion might occur in the absence of energy across sensory receptor.
- Constancy effect
- Apparent motion
 - Stroboscopic effect
 - Autokinetic effect
 - Induced motion

Now, we come to the perception of motion now perceived motions it might occur in the absence of energy across the sensory receptor and remember one thing that the constancy effect works here also. But in case of motion perception one is of course, you are moving the external world is releases static the other is when you are a static the external world is moving, but what is for more important and very, very interesting is the apparent motion. Three types of apparent motions we would be talking about the stroboscopic effect, the auto kinetic effect and the induced motion.

(Refer Slide Time: 16:28)

Motion Perception

- When eye moves with respect to spatial set-up, objects in the space seem to move at different rate.
- This rate depends on the relative distance.
- Objects closer to us seem to move faster compared to those which are away.
- Greater the distance of the object, smaller move it makes.

Now, when eye moves with the respect to spatial setup objects in the space they seem to move at different rate and this rate depends on the relative distance objects which are closer to us they seem to move faster compared to objects which are away from us.

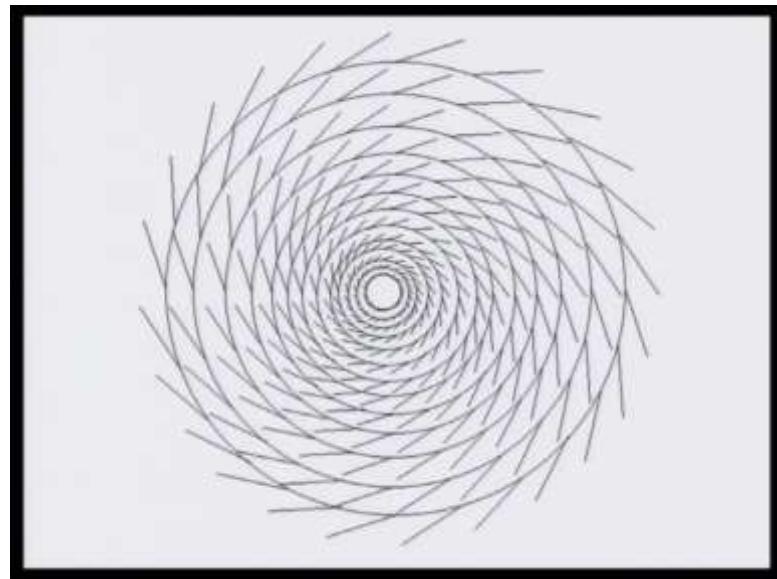
(Refer Slide Time: 16:49)

Motion Perception

- The lens of our eyes accommodate by changing its curvature to focus on objects.
- The lens become more curved when the object is nearer.
- It becomes relatively flat when the object is too far.

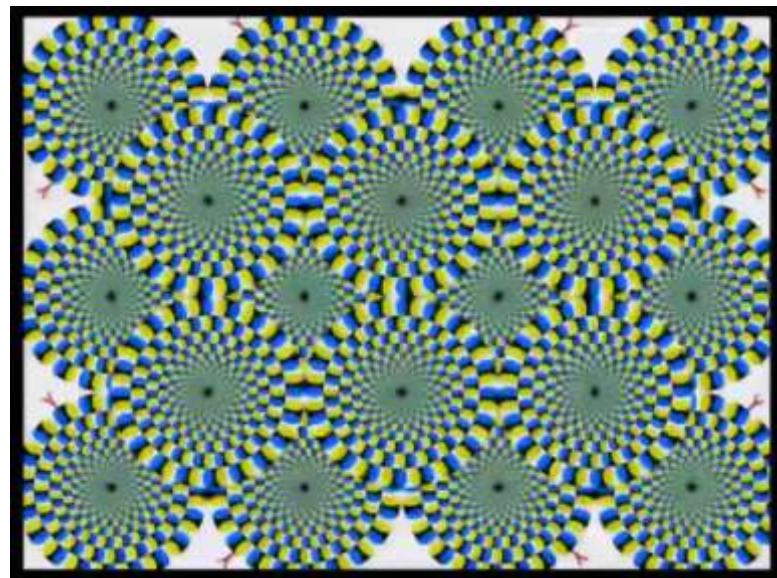
Greater the distance of the object smaller the movement, it makes the lens of our eyes they accommodate by changing its curvature to focus on objects the lens become more curved when the object is nearer it becomes relatively flat when the object is too far.

(Refer Slide Time: 17:01).



Now look at this very image the fact that you have independent circles and then there are small straight lines which are put all across these circles you sense as if something is starting at the center and there it is expanding in a circular order it is expanding and the diameter looks as if it is increasing.

(Refer Slide Time: 17:27)



Look at your screen now, when you look at these static images it does not look static to you, if you feel as if they are making clockwise movement and the movement you sense that it is making a clockwise movement you might get a feel that the colored disc on the

apparent perhaps make an anticlockwise movement although the screen is static, the image is a static the movement you focus at it you get a feel as if it is moving.

Let us come to a stroboscopic effect. Stroboscopic effect basically means that you perceive a running or a static sensation in a given type of a situation.

(Refer Slide Time: 18:13)



Look at this very video. When you look at this fan, you know that now the fan is rotating, but this movement is not perceived, you feel as if it is static.

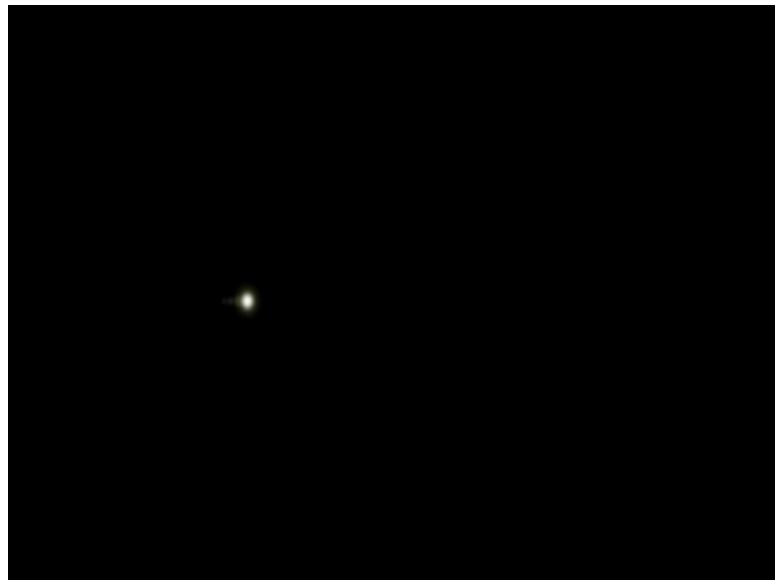
(Refer Slide Time: 18:39)

Motion Perception

- Autokinetic effect: If one fixates at a spot of light in a dark room, the spot appear to be moving.

Now the other type of apparent motion is what is called as auto kinetic effect. Now if you fix it at a spot in dark room you suddenly realize as if the spot is moving. So, room is absolutely dark you are looking at spot of lights you fixate at it and the movement you fix it, appears as if that light is moving on the right side look at this very video.

(Refer Slide Time: 19:03)



If you fixate at a spot of light in dark room, that spot appears to move. You have a dark background now. You have a spot of light here. Now, it is actually static, but if I ask you to know focus on it is a dark room just focus on it you start getting a feel as if this now white dot is gradually moving this is now called auto kinetic effect it is of course, an animation to help you understand of course, the light want appear to move so fast and of course, it won't have so many trails left behind, but then this is actually what happens you focus on it and then you feel as if it is now moving gradually of course, not at the rate at which you see here on the screen right now. But you can try it out know in your own house.

Another aspect in apparent motion is induced motion now static objects they are perceived to move when the frame or the background moves. So, it is like say I remain static and the background against which you are looking at that starts moving the movement you see there you realize as if there is a sense of movement. Look at this very animation.

(Refer Slide Time: 20:22)



Now look at this animation now you know that this man is not now cycling here he had just now his puts on the pedal the background is moving, but when you see that the background is moving the impression that you get is that find this man is cycling fast. This is actually induced motion.

(Refer Slide Time: 20:50)

Set & Perception

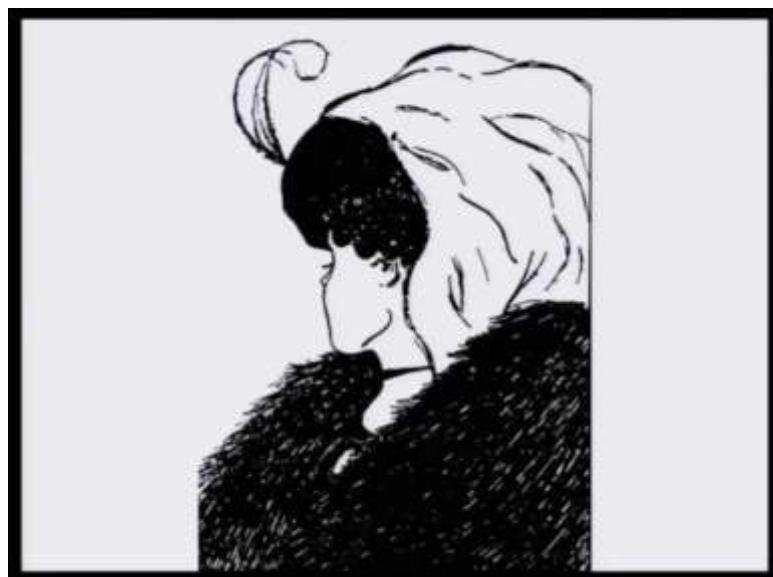
- The readiness of an individual for certain kind of stimuli.
- In such condition one does not consider all possible contingencies; instead, only a narrow range of possibilities are considered.
- Example: a mother towards the baby cry

. And now at the end we come to the importance of set in perception set basically means your readiness to certain kind of is stimuli. You remember in the beginning we did talk about the properties know of the stimuli the strength of the signal and then, we also said

that it is the user especially if you remember we were talking when we were looking at the radar warning system that it is the readiness of the operator to look at the signal and he has to make a distinction between the appearance the presence of the signal absence of the signal and whether it is and so forth. Now in reality, what actually you want to see what is your degree you preparedness, what is your preference. That is considered as set. So, set basically represents your readiness to look for certain kind of a stimuli and that is considered to be one of the important factors when it comes to perception.

Now, in such conditions where you have a preference to look at certain kind of a stimuli one does not consider all possible contingencies rather only narrow range of possibilities are considered.

(Refer Slide Time: 22:12)



Look at this very example, what do you see here ? There are 2 possibilities possibility one where you look at an old lady, this is the side profile of an old lady and look at the change close to the hairs you see the protruding nose and the eyelash and that gives you a sense that you are looking at the fear the side profile of a baby, a young baby versus an old lady. This is the distinction it is basically change in this very region that makes you realize whether you would basically we perceiving an old women in this very image or you would we looking at a young baby.

So, this is considered the importance of your readiness, your degree of preparedness, what actually you are keen looking at and with this what we have done till now is that we

have tried to understand that fine, there is mechanism biological mechanism that we all are end out with which helps us use our sense modalities to receive signal from the external world these signals are sent to the brain, the brain assigns accurate meaning to these sensations, if we are successful assigning meaning to it this is called perception.

Perception will depend on the strength of the signal perception will depend on the preparedness, the willingness, the mental set of the respondent the individual then there are certain conditions such as constancies that we talked about certain apparent type of things that happens that gets induced in us and there could be possibility when we do not succeed assigning accurate meaning to what we have sensed. If we fail assigning accurate meaning this is what is called as illusion. So, with this we complete our discussion on perceptual processes.

Now, that I have seen things in the external world, how do I learn it? So the next segment would be a series of lectures on learning.

Introduction to Psychology
Prof. Braj Bhushan
Department of Humanities and Social Sciences
Indian Institute of Technology, Kanpur

Lecture – 17
Memory Models of Memory

Till now what we have done? We have looked at how information is brought to the brain? How the brain assigns a meaning to it, based on our experiences that come to us how do we learn certain things now we are moving to the next step. That is once the information comes to us and we realize that there is a need for us to store it for little longer time for future usage.

Future usage could be say couple of seconds from now or it could be no even in the lifetime sometime. So, future is quite broad in that sense. So, when you realize that I need to store this information for little longer, I can use it in may be couple of seconds couple of minutes from now, or I might need this information much later in my life which is valuable for me. Then we try to store it and if we have successfully stored it then whenever needed we will like to retrieve it, if the process of storage works well if we succeed retrieving it from the storage this is what is called as memory, and in this third week we would exclusively focusing on the concepts that has to do with human memory processes.

Now, memory is basically studied in terms of mental processes that are involved in the storing and retrieving information. Now remember before memory we have talked about learning. The distinction between the two is that learning basically emphasizes on acquisition where as memory basically focuses on the retention and the retrieval of the information. So, if you acquire information that is what learning looks at. If you are more interested in terms of retaining the information and retrieving it wherever you need it then this is the part of memory. So, storage retrieval these are two important constructs that we would be looking at.

Now, memory system it stores information acquired through our sense modalities how the sense modalities they help our brain in terms of perceiving things that we have already discussed in the first week. Now this informations which come to the brain might qualify to be stored for relatively longer time and therefore, memory consists of many

systems, arranging from storage duration and buffer storage which primarily will take the information to long term storage. So, depending on the fraction of second to lifetime duration of a storage we will further classify memory into different sub types that exercise we will continue doing till the end. Therefore, memory basically is our cognitive system which is used for storing and retrieving the information.

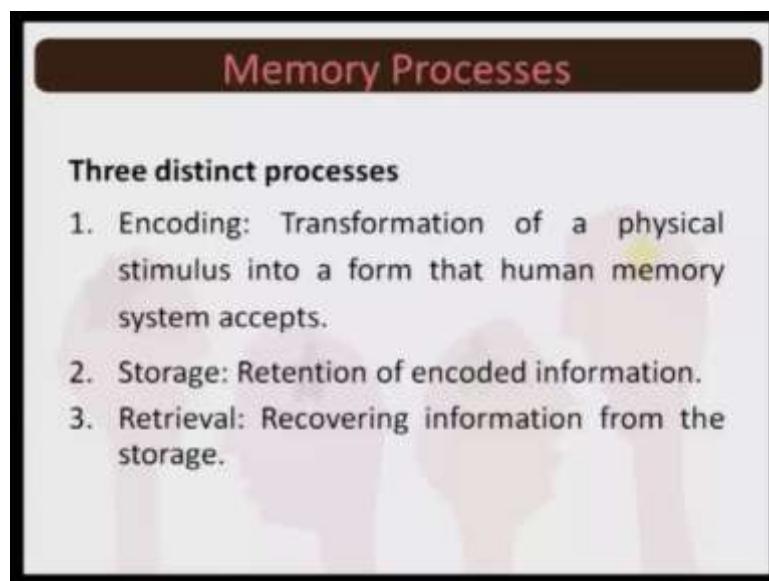
With this basic information about memory, let us understand what actually we are going to do as part of this very discussion deliberation for this full week we would be trying to understand what memory is, we would be looking at some of the dominant theories which tries to explain how human storage system works how the retrieval process works then we would be trying to understand that why is it important for human beings to memorize information? Why memory plays that important role and given the fact that memory plays such important role, How many types of know retrieval and storage processes are there one is of course, based on the timeline whether you store the information for few seconds, little longer or much more longer or depending on how you truncate it. You have the information which runs for certain duration of time and then depending on certain qualities you truncate it.

So, this would lead to know all types of storage of information the strategies that we use and then we will come to the reverse of memory reverse of memory would basically be the process called forgetting. If you commit error in terms of storing information or you have stored the information, but then you commit an error in terms of retrieving it, think of something like this, you are searching for a paper that you have filed in your cabinet your filing cabinet has that the specific paper that you are searching for that you are very sure about, but when you are search for it. You have all types of problems may be that people some people give proper file names way where they will put such type of documents. So, they would only look for those file names once they find the file name they will turn the pages and identify the paper this could be one.

The other situation could be that you make a random search and even in memory, we will see that random search actually does not work, some people might even go for ordering things putting things in certain orders in certain hierarchy that also works very well. Then you also might file the document based on it's relevance whether you would need it in the coming days, you whether you need it ,in longer duration ,papers which you think are redundant you will never need it depending on your classificatory scheme.

You will put the paper accordingly same is the story with the memory processes also life experiences all the information that comes to you depending on several parameters we try to give it code, we try to store it and the coding is needed because the brain understands a particular type of language storage again you need to store it for longer time and also you need to give it a proper file name. So, that when you want to retrieve this information you can just search for that specific file name and get the information. So, from that perspective, if you look at the memory process memory has three distinct processes encoding storage and retrieval.

(Refer Slide Time: 07:18)



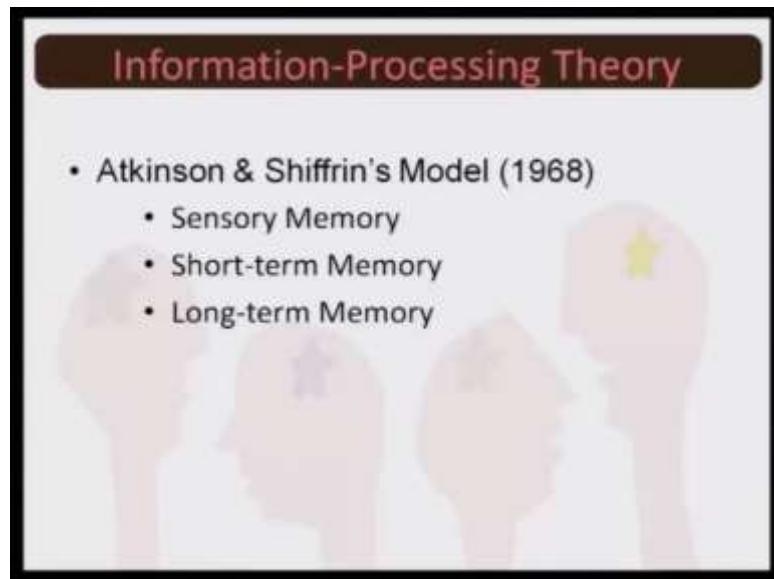
Now, encoding basically is the process of transformation of a physical stimulus in a form that human memory accepts. Now if I am looking at the camera right now there is certain form and I perhaps have some idea of what type of function this form performs and based on this utility or based on this form I create an impression, I know that if I see an object like this what this should be called I know that if I want a function like this to be performed what is the instrument that I would need.

So, this is the process of encoding the storage of course, is the process of retention the encoded information is reach the brain and now that encoded piece of information the brain will retain it with itself remember the storage would require a specific file name it is just like, we save files in our computers say for instance, if I have to deliver a lecture on memory and if I make powerpoint presentation I might love to give it a name the file

name memory because this will help me a lot in terms of know making search for where exactly is my PPT presentation that I have to use today. If I have say 126 power point presentations with me making random search will make my life hell. So, how you encode the information and how precisely how nicely how customize the file name you provide to the information that you have stored that plays a very crucial role and this crucial role comes into play when you try to recover the information that you have stored.

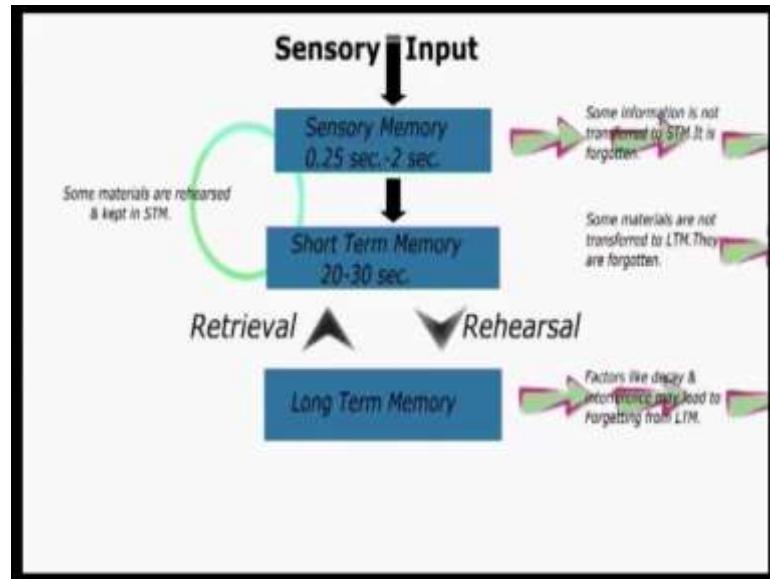
So, encoding storage and retrieval are three distinct processes which are of extreme relevance to memory processes two models.

(Refer Slide Time: 09:42)



We would discuss one the Atkinson and Shiffrin's model that was proposed in 1968, which tried to explain memory in trifurcated format saying that we have sensory memory short term memory and long term memory.

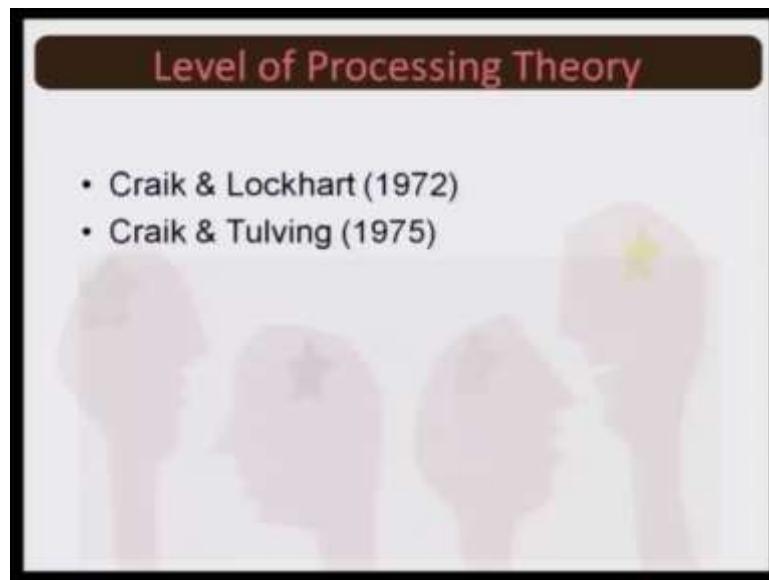
(Refer Slide Time: 09:55)



Memory starts with a sensory input received from the environment this input is retained for a very brief time ranging from 0.25 seconds to 2 seconds, some of these inputs are attended and rehearsed such input pass on to short term memory the unattended inputs are not transferred to short term memory and are forgotten the inputs can be held in the short term memory for 20 to 30 seconds. If they are further rehearsed they pass on to long term memory the unrehearsed once are forgotten the inputs moving to the long term memory as organized into categories they may remain here for days months or even lifelong and can be retrieved as and when needed decay and interference are some of the factors that lead to loss of information from a long term storage.

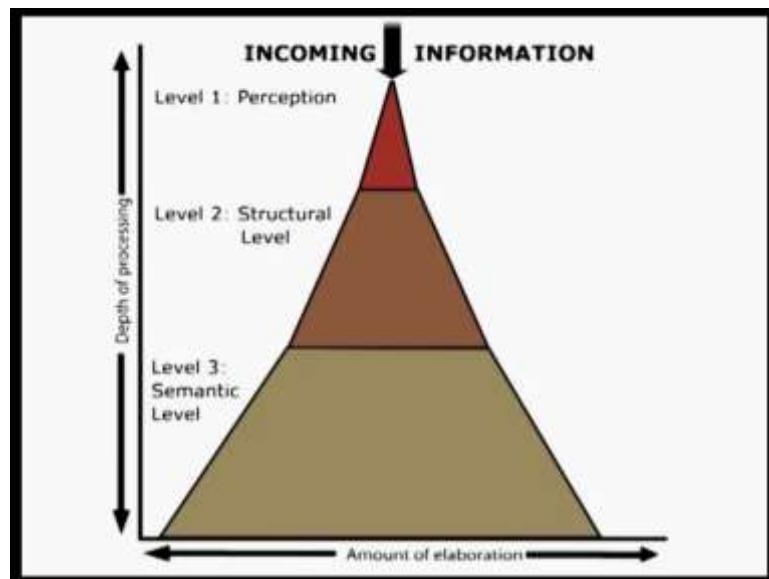
Because that Atkinson and Shiffrin's model they talked about the trifurcated structure of memory, just looking at it from a temporal point of view sensory short term and long term another theory was proposed by Craik and Lockhart in 1972.

(Refer Slide Time: 11:06).



Which further got revised by Tulving and Craik and Tulving came forward with a revised version in 1975.

(Refer Slide Time: 11:15)



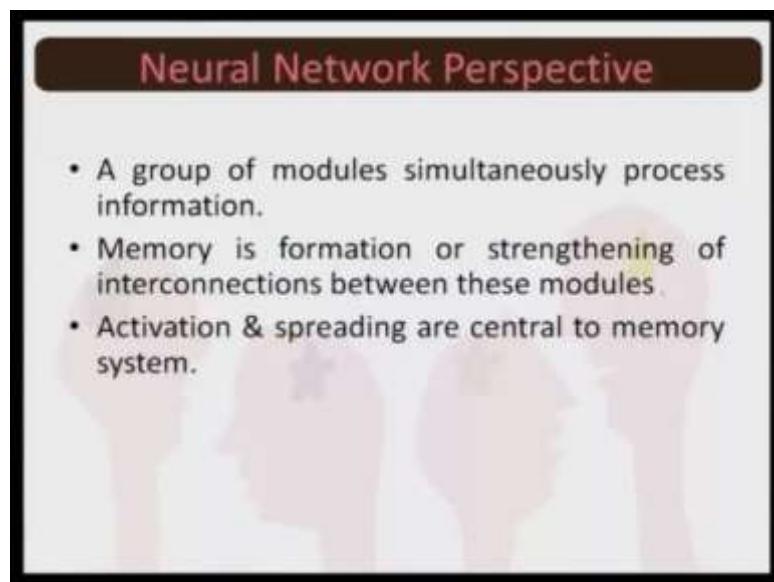
According to this model the incoming information can be processed at three different levels; perceptual level, structural level and semantic level. At perceptual level one becomes aware of the immediate environment. Structural level is somewhat deeper compared to the perceptual level. Here one emphasizes the structural features of the information. The deepest level of processing is the semantic level. Here one derives

profound meaning of the information, this model explicates that deeper the processing more is the elaboration, in other words deeper and meaningful analysis leads to durable memory of the information. Higher the elaboration more are the chances that the newly derived meaning integrates with the existing memories.

Now, you have seen the difference between the two models the first model which try to look at memory in terms of the three types of structures based on it is temporal programming, the second model which was more looking in terms of the elaboration process, whether you look at the information only from a perceptual point of view, whether you look at the information from a structural point of view or whether you go for an extensive elaboration there by suggesting that the more and more you elaborate perhaps you understand things better and if you have more if you have more of semantic meaningfulness driven type of a memory you will store it better.

The third perspective on memory is what is called as the neural network perspective. Now neural network basically talks about know the groups of modules. So, it says that there are various modules which form a group and these modules basically they help perform simultaneous functions memory is nothing according to the neural network perspective.

(Refer Slide Time: 13:23)

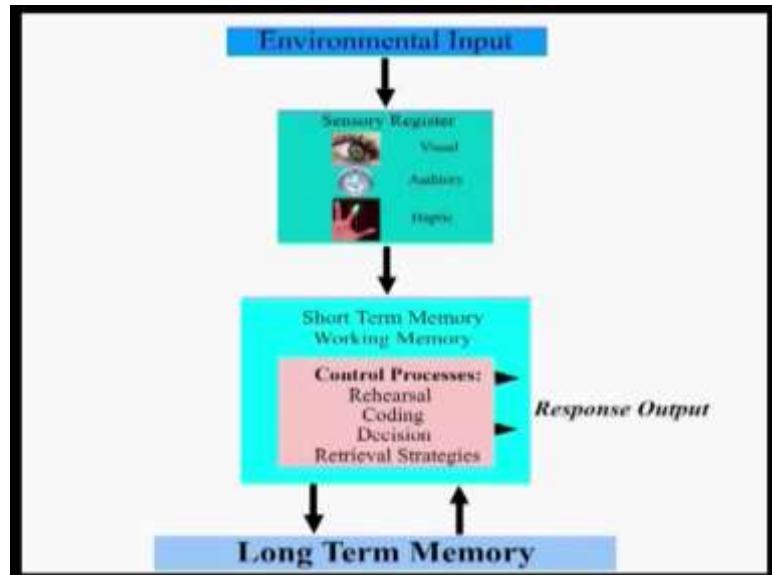


But it is formation or strengthening of these interconnections which get formed between different modules, now the activation and the spreading they are the two central

components from the neural network perspective related to memory. So, what happens you get the information from the external environment you encode the information, you have modules which would be entertaining those encoded information and ones the traces are formed when you repeat it the second time, and it gets the strengthened. Now two or more modules they get inter connected and this formation if it is repeated it gets strengthened when you activate it you are able to store the information now more and more is the formation of the module more and more is the connectivity between different modules. The more spreading takes place you have better memory. So, there is a spread of this strengthened associations the stronger the association, the more wider the network better would be the memory and when you activate it, this is how the memory system gets operationalized this is the neural network perspective.

Now, that we have discussed three important concepts ,the model given by the Atkinson and Shiffrins the model given by Craik and Lockhart, which further got revised in collaboration by Tulving and the neural network perspective, if we combine all these information and try to evolve a comprehensive model of memory. So, what is memory all about, how does our memory function? This is how we would explain it.

(Refer Slide Time: 15:19)



This is what you get if you summarize the existing knowledge on memory system, then our sensory register mostly gets information from the visual auditory and the Haptic senses, the rehearse information then moves to the short term memory system those

encoded and rehearsed further move to the long term memory system. Depending on our decision to respond to the environment we use certain retrieval strategies to get the desired information from the long term storage, the response outputs are mediated by our working memory.

Now, let us go back to our first week, what we discussed there was that visual kinesthetic, somesthetic, vestibular, auditory, olfactory all these channels they are basically meant to provide information to the brain, given the fact that the brain receives stimulus from all these sensations, one can think that if memory is guided by the information that comes to the brain then ideally it should store all type of information.

Now, let me give you an example say if your mother for instance just comes and know keeps her palm on your shoulder without hesitation within fractions, you would arrive at a conclusion that it is my mother this recollection you are you have not looked at your mother, it is only the touch of the mother which made you identify, make a correct identification that it is our mother. Where as if somebody else touches you are not able to provide the correct meaning to it why and this gives you a feel that fine a touch based memory could also exist.

Previously I was telling you that, if I look at a camera and I know this is called camera the structure the form the function both. So, next time if I see this structure I know this is camera and if I needed something to be recorded I know which instrument can perform this function and then I will say I need a camera. So, it is the visual part it is the understanding of the mechanism and now imagine another situation you are somewhere who close to a railway track you are not able to see a train, but you hear the sound of a moving train, just with the help of this auditory input you can sense that fine this the source of this very sound is a moving train which perhaps is at certain distance from me.

Now, one sound how does it make you understand that this comes from the train again there must be something that the brain has stored based on the auditory process say somebody gives you something to taste you put it on the tip of your tongue. Yes I remember there is something else also which resembles to this taste or this taste is equivalent to something that you and the person with whom you are sharing this experience also is aware of then you realized that there could be a taste based memory also.

So, what I am basically trying to tell you is that because the brain receives inputs from all sense modalities you can assume situations and you can very easily identify cases from the real world situation where your own experience will tell you that this part of my memory is basically guided by the input, which has come from a given sense modality having said this let me confess that research in psychology has largely been conducted only using two sense modalities the visual processes and the auditory processes. So, eye and the ear these are the only two sense modalities through which how the information is captured how it is processed how it is stored whole lot of research has gone into it and the third set of research which is not as comparable as the visually or auditarily guided research in memory is the touch based memory.

Rest of the sense modalities they have not been examined as thoroughly as the first two and then the third one, therefore, we will for our understanding of sensory memory will focus on only three types of memories.

(Refer Slide Time: 20:45)

Sensory Memory

- We have already discussed the visual, hearing, smell, taste, and somesthetic processes.
- Although we receive sensation from all these sensory modules, visual and auditory system based memory processes have been studied most.
- Studies are also available on the haptic sensation based memory.
- Hence, here we will go into the details of visual (iconic) and auditory (echoic) memory.

the sensory memory which has to do with vision that is the iconic memory sensory memory that has to do with auditory process that is the echoic memory and the sensory memory that has to do with Haptic sensation the touch based sensation, but because largely research has been guided by the iconic and the echoic memory. So, for this very module ten hour brief module we would be no talking exclusively with respect to the iconic and the echoic memory.

(Refer Slide Time: 21:15)

The slide has a dark red header bar with the title "Sensory Memory" in white. Below the header is a white content area with a black border. The content area contains the following bullet points:

- The iconic and echoic memory store visual and auditory information as part of processes involved in perception.
- Both these sense modalities are distinctive as they allow the initial stimulus to be prolonged.
- This ensures the probability of processing at a later stage.

Iconic and the echoic memory basically, they store visual and auditory information as part of the process involved in perception. So, eye and ears both are responsible for the process of perception they are the first source the biological entity in our body which receives the signal from the external world. Now both these sense modalities are distinctive because they allow the initial stimulus to be prolonged this means that when the eyes they get activated because the light falls on the retina you remember in perception we had said that the cis state converts into the trans state and again gets back to the cis state because it has to be ready enough to receive the second set of single.

Now, this very transformation the at the level of retina the rod cells and cone cells the light falls and the cis configuration becomes in the trans state the time that, it will take to get itself back to the cis state is the time which basically the eye gives to it gives to itself to retain the information for certain period of time. So, the visual information although it has crossed to the optic track till this know information till this chemical configuration realigns, the information is stored at the level of eyes this is iconic memory, now recollect what we have discussed about the auditory mechanism what we discussed was that the sound wave it enters to the middle ear, it goes to the inner ear where in the cochlea we have the fluid and the wall of the cochlea which is the hair follicles this fluid starts shaking there by making movement in the hair follicles these hair follicles in turn triggers current in the nerve circle this neural circuit.

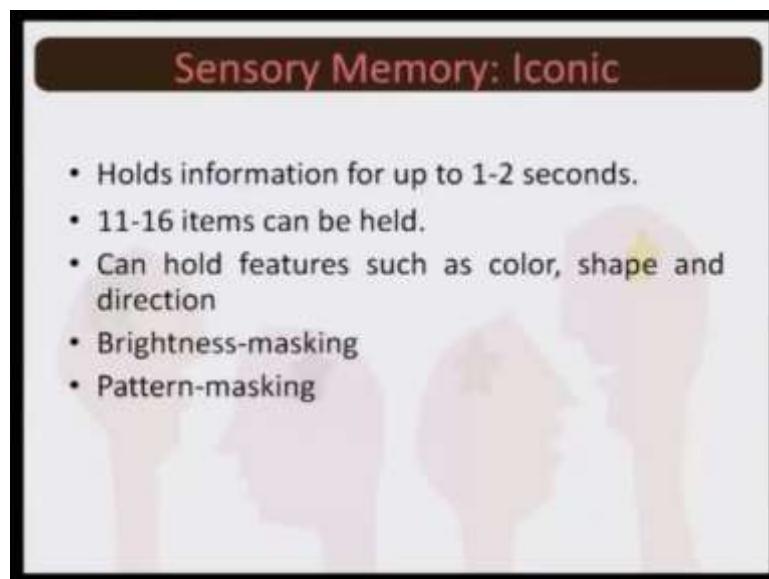
Finally, is perceived by the brain assigned the meaning and thereby we hear meaningful things in the world, but recollect your other experience of throwing a piece of stone in a still water or if you do not have that experience recollect the experience of know collecting water in a bucket that falls from the tap, you close the tap and one or two drop still falls in the buckets and you realize that the ripples create in the water it takes certain time for the ripple to settle down.

Now, convert this to the working mechanism of the ears the cochlea has the fluid the fluid shakes. So, once the shaking has begun it will take time to slow down and then gradually get stabilize. So, that would been that till the fluid in the cochlea now moves then, hair follicles will also move and till the hair follicle moves ear is capable of retaining the auditory information and this the source of echoic memory. So, what happens? Eyes and ears both are now capable of storing the information for shorter period of time to ensure or to allow you the probability of processing this information at a little later stage and these are the biological foundation of sensory memory specially remembers we are only with reference to iconic and echoic memory.

(Refer Slide Time: 25:14)

Sensory Memory: Iconic

- Holds information for up to 1-2 seconds.
- 11-16 items can be held.
- Can hold features such as color, shape and direction
- Brightness-masking
- Pattern-masking



Now, iconic memory that has to do with the eyes can hold information for up to 1 to 2 seconds. Remember when you will come to the echoic memory you would realize that ears are able to store information for little longer period of time compared to eyes why that question we will take up when we come to echoic memory. Now what happens in

the case of iconic memory shorter period of time just 1 to 2 seconds, but then you have longer piece of information 11 to 16, items can be held right at the level of eye for 1 to 2 seconds you can imagine the capacity of iconic memory further what is far more interesting is to understand the fact that features which are extremely important for us to perceive the world such as color such as shape, such as direction you remember Muller Iyer illusion example that we took, it had arrow-headed line feather-headed line. So, direction was there different lines had different colors entire Gestalt principle ,bubbles that used to come as examples all of them were colored.

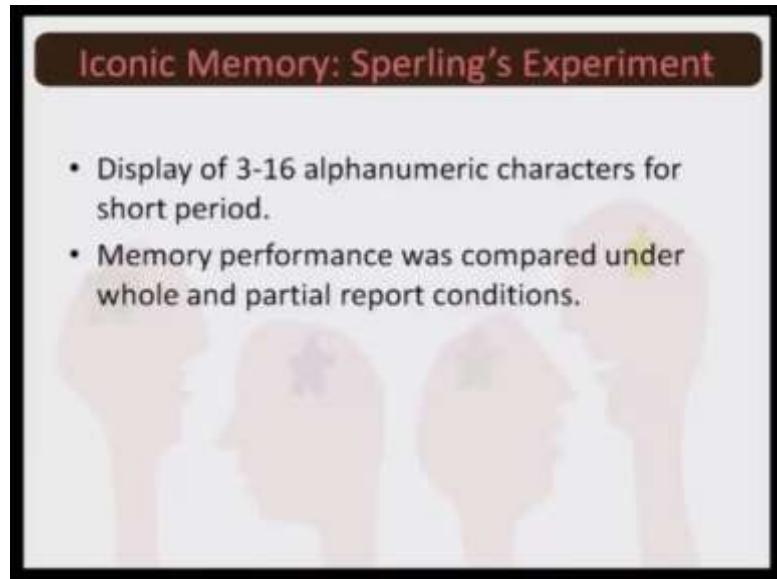
So, the shape color the direction all these features can be stored and eleven such information 11 to 16 such information can be stored right at the level of eye what would this mean this would mean that, when you saw examples whether it was a line whether it was horizontal whether it was vertical whether it was a bubble whether it expanded. Whether it moved in what you call vertical direction diagonally horizontally everything you could store right at the level of the eyes, multiple information up to two seconds this is what happens at the level of eyes and this is called iconic memory; however, our iconic memory has 2 limitations first. If you vary the brightness level once you now change the brightness then, you realize that you now some degree of masking has taken place right now the level of brightness was this much you add one more glowing light or you switch off one more light and you realize that the brightness pattern has changed because in perception also we have discussed this based on the balance between white gray and black the perception quality changes.

Therefore 2 information can get masked it can interfere. So, this is called brightness masking similarly we can have pattern masking more than one pattern, if it super imposes one gets overlaid over the other and you get a combined image of the two. This will be called as patterned masking. So, in terms of efficiency we know 11 to 16 items color shape direction all such important features for up to 2 seconds that is the capability of the iconic memory limitation it know has it's limitation. When you tamper the brightness level and if you vary the pattern then also it has certain limitations with respect to iconic memory let us also discuss one of the interesting experiments done by Sperling.

(Refer Slide Time: 28:46)

Iconic Memory: Sperling's Experiment

- Display of 3-16 alphanumeric characters for short period.
- Memory performance was compared under whole and partial report conditions.

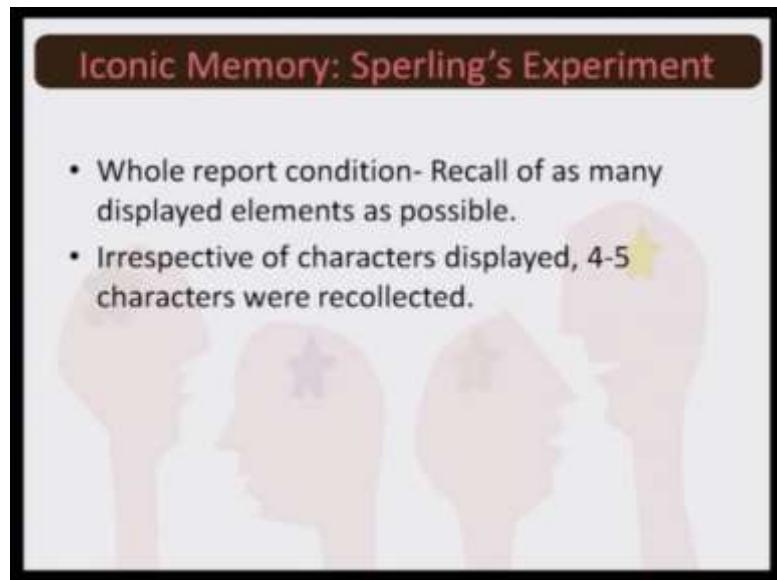


Now, three to 16 alpha numeric characters were displayed for shorter period of time and performance in terms of memory was compared under two conditions the whole report condition and the part report condition.

(Refer Slide Time: 29:02)

Iconic Memory: Sperling's Experiment

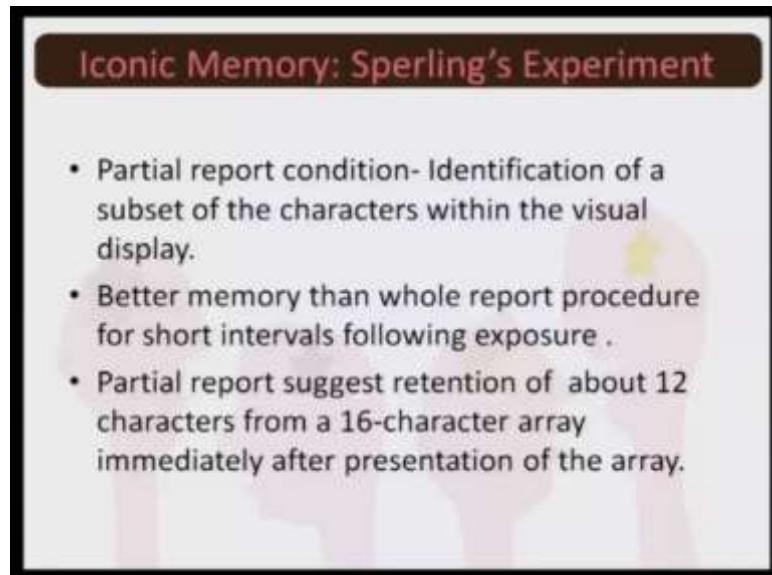
- Whole report condition- Recall of as many displayed elements as possible.
- Irrespective of characters displayed, 4-5 characters were recollected.



Now, in the whole report condition recall was basically suppose to be done with respect to as many information as many elements of information, it was initially presented how much the participant is able to recollect now irrespective of that characters displayed it was realized that only 4 to 5 characters were recollected this was the whole report

condition where the recall was suppose to be of maximum possible number of elements what happened in the case of partial reporting condition.

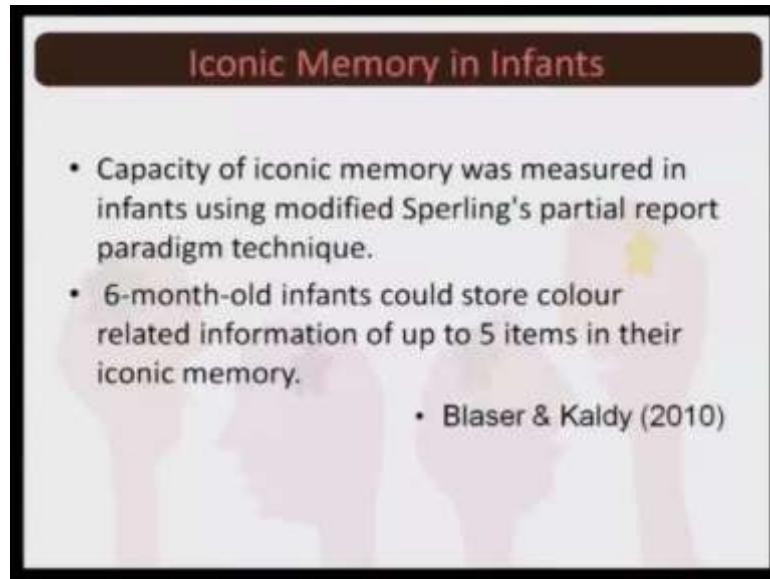
(Refer Slide Time: 29:42)



In the partial reporting condition the participant was basically suppose to identify the subset of the characters within the visual display and it was realized that memory was better in this case. So, better memory compared to whole report procedure and partial report also suggested that retention is possible for about twelve characters from a 16 character array. So, if this alpha numeric character there was 16 alpha numeric characters 12 at least could be recollected in the partial report condition suggesting that, if you are allowed this freedom to go for a partial recall this is a better condition compared to the whole recall condition.

Another interesting information of research not so very old conducted in 2010 which tried to modify, Sperlings partial report paradigm technique and tried to find out if iconic memory works in the case of infants also because whatever we were discussing had to do with adults.

(Refer Slide Time: 30:57)



The slide has a dark red header bar with the title "Iconic Memory in Infants" in white. The main content area is white with a black border. It contains two bullet points and a citation:

- Capacity of iconic memory was measured in infants using modified Sperling's partial report paradigm technique.
- 6-month-old infants could store colour related information of up to 5 items in their iconic memory.

• Blaser & Kaldy (2010)

Now in infants this very study found that and even for human children who were just 6 months old they could also store color related information and up to 5 items were known stored at the level of iconic memory. So, you can visualize that right from very early stage in our life iconic memory vision based memory which basically serves us for a very brief period of time not more than 2 seconds, time plays an important role when we meet tomorrow we would be talking about echoic memory.

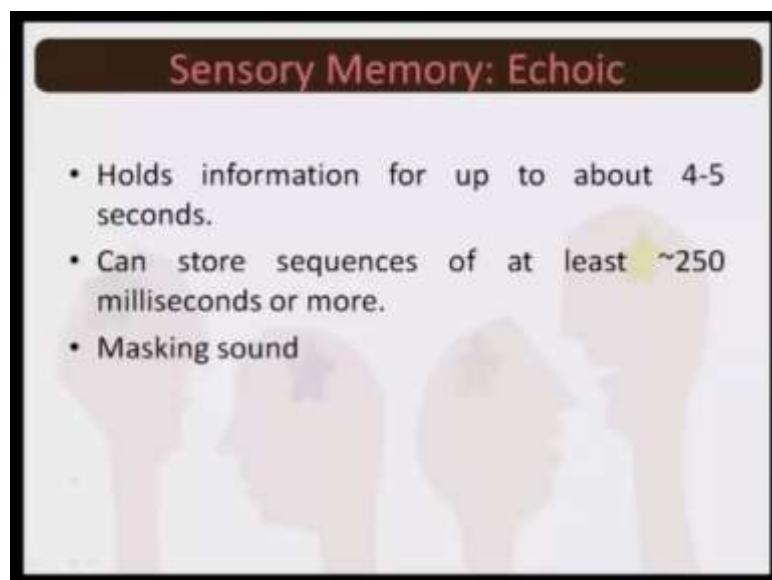
Key words - memory processes, sensory, iconic, echoic, encoding, storage, retrieval

Introduction to Psychology
Prof. Braj Bhushan
Department of Humanities and Social Sciences
Indian Institute of Technology, Kanpur

Lecture – 18
Memory Short Term Memory – Storage and Retention

Till now we have talked about iconic memory. Let us now move to the other form of sensory memory that is echoic memory. In case of iconic memory, we discussed that the total amount of information that can be retained is little more, but in terms of duration it had relatively shorter period compared to echoic memory because echoic memory can hold information up to 4 to 5 seconds.

(Refer Slide Time: 00:46)



And furthermore it can also store the sequence of at least 250 milliseconds or more. Now recollect what we talked about in the previous lecture and this has done with the way we have talked about issues in case of sensation. We said that ear, specially the inner ear which has the fluid filled in the cochlea has the nerve endings and because the ripples that are created it takes little longer time to settle down. Therefore by default the amount of information that will be held at right at the level of the sensory modality will be little longer. Because in the previous case, in the case of eyes it was basically the sis to the trans configuration and back to the sis configuration, which was now basically facilitating the storage of information.

Where as in the case of echoic memory, it is the settling down of the ripples that is created in the cochlea and therefore we realize that in terms of the auditory impulse that we receive from the external world, the amount of information even though it might be less, compare to what we retained at the level of eyes, but in terms of duration we have much more longer life compared to iconic memory for auditory information, but the problem is because both of them have very limited period of time, Iconic memory for 1 to 2 seconds, Echoic memory for at max 4 to 5 seconds, the chances are that if you have a stimulus of the same intensity that enters the ear then there would be a muscle. You remember even in the case of iconic memory we say that brightness and pattern masking are possible even at the level of the sensory modality.

Similarly, here in the case of echoic memory the sound masking can take place and this becomes a barrier. Because it will not allow you to listen to what you call the purest form of the auditory impulse and retain it for a maximum of 5 seconds. Having discussed echoic and iconic memory, let us just now make comparison between the two. Iconic memory, in terms of duration it just 1 to 2 seconds, whereas echoic memory in terms of duration it is 4 to 5 seconds.

(Refer Slide Time: 03:20)

Sensory Memory	
Iconic Memory	Echoic Memory
<ul style="list-style-type: none">• Holds information for up to 1-2 seconds.	<ul style="list-style-type: none">• Holds information for up to about 4-5 seconds.
<ul style="list-style-type: none">• 11-16 items can be hold.	

So the life of echoic memory is little longer compared to iconic memory, but the advantage in the case of iconic memory is that, it can store, it can retain relatively longer amount of bit of information.

So, approximately somewhere between 11 to 16 items can be held in terms of iconic retention. Echoic retention the moment you have now two sounds of equal intensity masculine will take place. Now having talked about sensory memory, let us now go to the other form of memory that is the short term storage, the short term memory. Now in terms of life short term has much more longer life compared to the sensory memory.

Iconic just 1 to 2 seconds, echoic just 4 to 5 seconds, but short term can store information for approximately 30 seconds. So, 20 to 30 seconds is the elastic time limit for which information can be stored in the short term memory. This would mean get after end of 30th second, either the information which is at the level of the short term memory would trickle down go to the long term storage or it will be basically replaced, it will be flushed out by the incoming information and we saw in the comprehensive model of memory that loss of information takes place from all the 3 channels.

So, sensory memory, short term memory, long term memory from everywhere we have now loss of information, but in case of short term storage either the information moves on to long term storage or the information is lost and replaced by that incoming information, but you also interesting about short term memory is that the information that comes to short term storage is encoded.

In acoustic format say speech, sound, visual images, words they constitute, the code that is retained by the short term memory. Because these are meaningful things, speech has its meaning, sounds might have meaning, visual images would represent something and words which is again not nonsense syllables.

(Refer Slide Time: 05:21)

Short-Term Memory

- Information held for 20-30 seconds; thereafter it is displaced by incoming information.
- Information encoded in STM is acoustic in nature (Speech, Sounds, Visual Images & Words).
- It is semantic in nature.
- Meaningful words may be stored easily as compared to nonsense syllables.

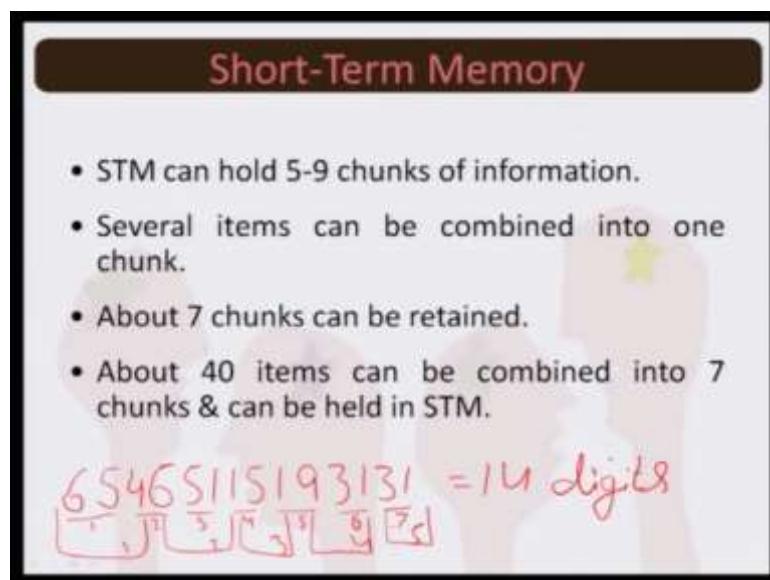
So, because it is word therefore, it would carry some meaning therefore, the information that comes to short term memory, it is largely semantic in nature, it is meaningful in nature and because meaningful words, meaningful symbols, meaningful sounds, allows you to process it in a different way compared to when you have nonsense syllables or you have thinks which are completely devoid of meaning. So, the movement you start elaborating it, you remember the (Refer Time: 06:36) know. So, perceptual level of analysis, structural level of analysis, semantic level of analysis, all of them had different impact on memory. So, if we go for meaningfulness then by default you elaborate the information, because you elaborate the information therefore, semantic things meaningful things will have a longer life compared to meaningless things.

There are the whole lot of research in psychology comparing meaningful words with nonsense syllables and there it has been uniformly realized, that meaningful words, they have stronger storage compare to the nonsense syllables. This thing is you know pretty obvious say for instance, if you are told rose, it is much easier for you to have a mental image of rose and there by remembrance of the word rose will be little longer compared to let us say XTPY which is nothing but four distinct alphabets that have been a temporally presented very neck to neck, because it has been pronounced altogether therefore, you might try your best recollect it, hold it for little longer, but then it is extremely difficult if such information, such set of nonsense syllables are presented to you in a sequence. What has further been realized in case of short term memory is, that if

you have a longer piece of information then the possibility is that you might break it into smaller chunks.

Now, think of a situation, you are given a number, a number which is, it has long-long chain of numerals. Let me show you this example and then I will come back to the discussion on (Refer Time: 08:40)

(Refer Slide Time: 08:41)



Now look at your screen, I am writing certain numbers. If I ask you to memorize this number and retain it at least for 30 seconds because that is the duration of short term memory. Now if you start now memorizing each of them, you have longer chain now. So, you have total 14 digits here. Now if you want to memorize it as 14 different set of information, you are putting your short term storage in a big problem. Usually what has been realized that most of us either form chunks of 2 or 3 bits of information.

So, those who would form chunks of 2, would do something like this 6 5, 4 6, 5 1, 1 5, 1 1, 3 1, 3 1 now this 14 basically becomes 1 2 3 4 5 6 and 7. So, simple 7 chunks now this is something that very easily your brain can store. You would realize that there are people who form chunks of 3. So, they would do something like this. So now you have one two three four and just five chunks life becomes much simpler. So, if I have to recollect the number it becomes very easy for me. Why it becomes easy for me? Because I am now trying to now memorize the number in terms of chunks.

So, I say 6 5 4 6 5 1 1 5 1 9 3 1 3 1 it is much easier. You would realize, that say for instance take when you have to recollect the mobile number which is a ten digit number in our country. If you have to memorize that number how do we do that and you would realize that even if you take your own example perhaps you do not remember more than three four mobile numbers. You remember mobile numbers of only those which matters to you, parents, siblings, best friends, something like that. Now what we do that if we have a longer set of information, we break it into pieces and these smaller forms of information, which is either I said know you can combine two of them or you can make a chunk of 3 bits of information, 4 bits practically you will not find people using 4 bits.

Now, things become much easier and therefore, it has been realized that somewhere between 5 to 9 chunks can very easily be stored in short term storage. So, 9 chunks may will primarily mean that 9 into 3, if you are making a chunk of 3. So, 27 bits of information you are basically able to store for approximately 30 seconds. Similarly in children say if the minimum span is going to be 5, then 5 3's are 18. So, 18 bits of information a child can also store and then in terms of say if the number of items, now that we are extending that say there could be possibility of forming chunks of 4 then you realize that approximately research is show the 40 items can be stored forty discrete items broken into chunks an accordingly the chunked information when you recollect it when you store it, you realize that 40 distinct item can be stored right at the level of short term memory.

So, if you compare iconic versus echoic. So, the maximum that sensory memory could provide was at the level of iconic memory with eleven to 16 items, here is short term memory we go up to 40 items. So, this is the huge jump now, both in terms of pieces of information and also in terms of that temporal duration of the stay of information.

Now two things are very interesting in short term memory, say for instance if you are given a list, a list which has say 20 names of people who can be your friends, you are told the list, you here it and then you are told to remember the nomenclature say for example, I Ramkumar, Vishwakarma, Pradeep Kumar Sinha, Arun Kumar Singh, Vishwanath Kumar Sharma, I keep on telling you names or the way the psychologists have done in terms of their experimental work.

That they have taken alphabets combination of meaningful and then nonsense syllables both in increasing order of difficulty, for examples h e he these are two alphabets he is a pronoun, s h e she three alphabets, but it has a meaning. So, the difficulty level has changed, from two alphabets he two, she three alphabets, then I say h o m e home; so 1 2 3 4 alphabets, so 2 alphabets, 3 alphabets, 4 alphabets.

So, with increasing degree in the list you also increase one alphabets therefore, this is called as a hierarchical difficulty level. Similarly if I make nonsense syllables I just put alphabets which has no meaning x t two alphabets and I compare h e he versus x t, the second alphabet was say the second word was she, now s h e and I say x t p, the third word was home which had four alphabets and I say x l z p. It has been realized whether you use meaningful words or you use nonsense syllables, two effects will very interestingly come forward and these effects combined they are called as serial position effect.

So, the position of the meaningful word or the nonsense syllable in the series, this is called serial position effect and serial position effect will have two things, primacy effect and the recency effect. Primacy effect the effect the recall of the items, which are presented in the primary stage in the initial stage that is the primacy effect if I start with the he-she home and go up to knowledge government statistics, the longer ones then you realize that the words which are spoken in the beginning they have a better recollection why they have a better recollection because you were mentally ready for the test, you knew that certain words will be presented to you and you will be asked to reproduce it.

(Refer Slide Time: 16:12)

Short-Term Memory

Serial-Position Effect

- Primacy Effect: Better recall of items at the beginning of the list.
- Recency Effect: Items encountered most recently are remembered well.

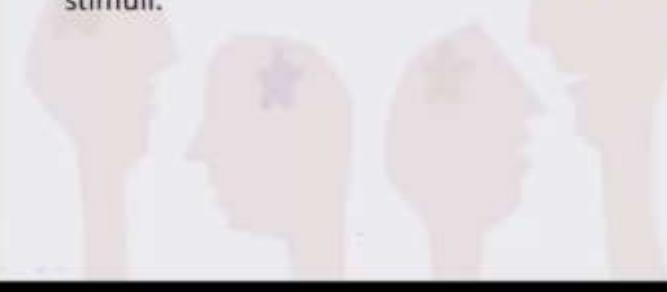
Then the words that come in the center, they have known the adverse effect in terms of recollection, but then the words which came towards the end, before the test terminated in your asked to recall the word those words also have a better probability you are being recalled and that is called Recency effect. Why? Because these were the item that you encountered most recently and because it was encountered very recently therefore, the chances of it being recollected is very high fine.

So, primacy and recency effects, these two are known very much dominantly found in short term storage. In the combined order, both these effects are called as serial position effect.

(Refer Slide Time: 17:36)

Short-Term Memory

- Primacy effect is observed during delayed recall because the initial items get time to be put into LTM during the presentation of stimuli.

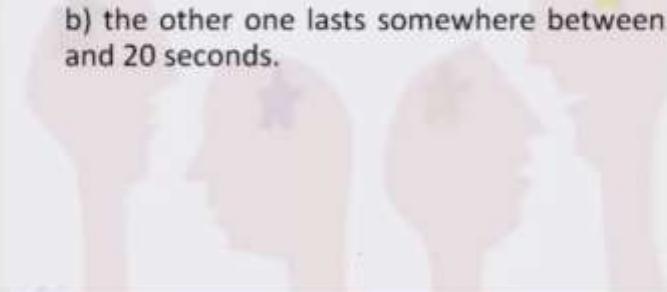


Now, primacy effect is observed during delayed recall because the initial items they get time to be put in the long term during the presentation of the stimuli. So, there is a possibility that although we say that this is something that you find in the short term storage there is a possibility that the information might trickle down to the long term storage as well. In terms of short term auditory memory there are now evidence for two short term auditory storage.

(Refer Slide Time: 18:02)

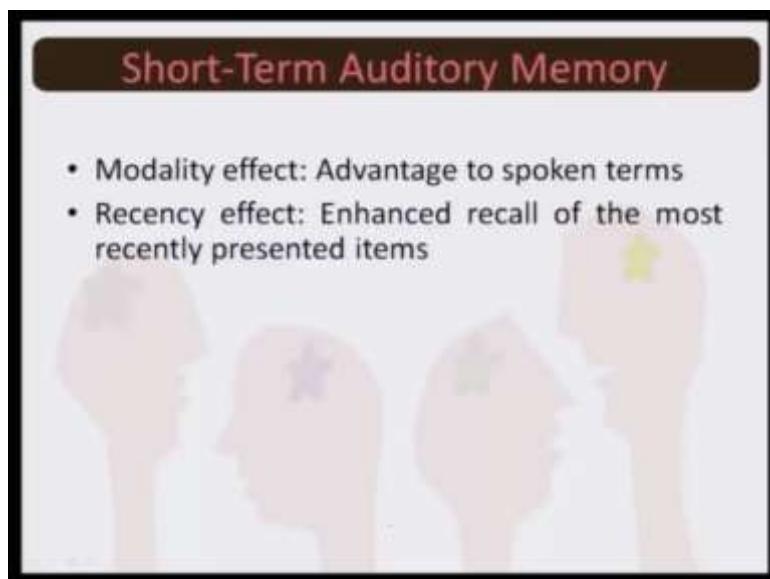
Short-Term Auditory Memory

- Evidence for two short-term auditory stores-
 - a) one operates over a timescale of 150-350 milliseconds
 - b) the other one lasts somewhere between 2 and 20 seconds.



One which operates over a time scale of 150 to 350 milliseconds and the second one which basically lasts somewhere between 2 to 20 seconds, again you find that even though it is now more acoustic in nature, there could be a possibility, that there could be two different auditory storage system that is working, but remember one thing because we are on an introductory course we are also on a brief introduction to this very course. Therefore we will not venture into the details of all these things. There is also something called modality effect and recency - effect recency we have already discussed,

(Refer Slide Time: 18:52)



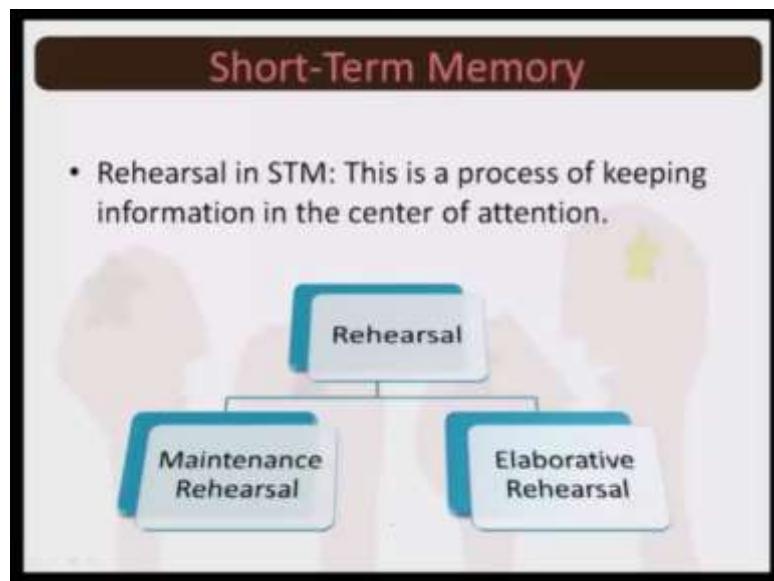
But in terms of auditory memory there are also advantage to the spoken words know. So, the modality that has been used for inducing the information, for sending the information to short term storage and the nature of that very single is something that also places it is role in terms of short term auditory memory. Now what is very interesting in short terms storage is that there could be a possibility of rehearsing the information. Why there is the possibility of rehearsal? Because the information has come and unlike the sensory storage, you have the possibility of storing the information for approximately somewhere up to 30 seconds.

Now, before you understand what rehearsal means and what the two different types of rehearsal are, understand this information by recollecting one of your past experiences. I am just trying to state a situation and you try to recollect something that you had experienced in the past. Say you look at telephone number in the directory 2 5 9 7 0 2 4

that is the number that you read in the telephone directory and then you start moving towards your say drawing room, where the handset is kept. The telephone directory was put somewhere else the telephone handset is put somewhere else and what you have to do is to remember this number till you dial it. So, what we do usually we remember 2542592592597024 - what are we doing remember we are chunking the information.

So, 259 forms one chunk, 7024 forms the other chunk and then once you come to that handset and you dial 2597024 the moment you have completed the dialing you forget the number that you have tried to store for that period. You knew that the significance of this storage is only till you successfully dial the number. You were rehearsing the number, but what you are actually doing? You were rehearsing because you wanted to retain information only till you could successfully dial it. This is called Maintenance Rehearsal.

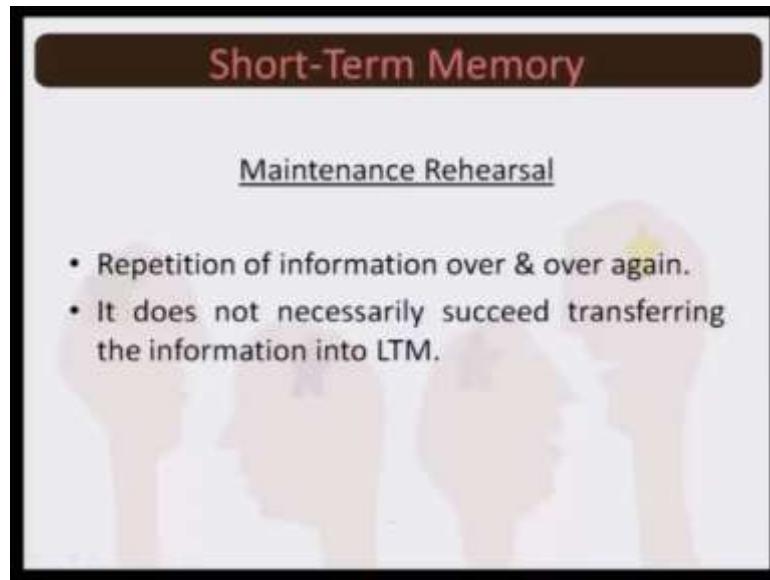
(Refer Slide Time: 21:35)



You are maintaining the information till the goal is achieved the goal is to dial this number, that is it. The second set of rehearsal would be when you go for more and more of elaborative expansion of it. So, you receive the information and then you start elaborating it. So, while rehearsing it you try to understand who this man is and in what way is he related to my father? Why is he is that my father has asked me to convey this to him over phone? His name is exactly the name of a neighbor of mine who have also been a good friend of my father. He was we are now stretching that information know. This rehearsal now is becoming elaborative in nature.

Therefore in short term there is a possibility of a rehearsal, which could either be maintenance oriented or it could be elaborative in nature. If it is elaborative in nature we say it is elaborative rehearsal. If it is only for given period of time then it is called Maintenance rehearsal and rehearsal plays an extremely important role in short term storage.

(Refer Slide Time: 23:00)



Now, in maintenance rehearsal the repetition of information is seen over and over again, but it does not necessarily succeed transferring the information to long term memory. Whereas, in elaborative rehearsal there are chances that the information will be transferred to long term storage. Compared to maintenance rehearsal in the case of elaborative rehearsal, the organization is done of the given material in terms of providing meaning to it while it is being rehearsed?

(Refer Slide Time: 23:24)

Short-Term Memory

Elaborative Rehearsal

- Organizing the given material & giving meaning to it as it is being rehearsed.
- This helps in fitting it with the existing organized LTM.

So, you are rehearsing it, but you are also trying to give meaning to it and therefore because meaning is being assigned, therefore it helps in fitting this very information. Get the information that already exists in our long term storage. Because the information is now put in hierarchy it is put in a meaningful order therefore, it resembles to the pattern that suite to the long term storage. Therefore elaborative rehearsal is bound to push the information towards long term storage. Pushing information towards longer storage memory means that the information will now be available to you even after the lapse of 30 seconds duration.

The concept of chunk that we talked about 7 plus minus 2; 7 minus 2 will be 5 and 7 plus 2 will be 9 you remember in chunk, we said 5 to 9 chunks can be stored. So, this is basically the outcome of 7 plus minus 2 this is called Magic number, because this allows the information to be ordered in the form chunks and this chunk, combination of it can be stored with us for a relatively longer period. So up to 30 seconds maximum of 9 chunks and if you combine them together, then this helps us a lot in terms of arriving at a decision.

(Refer Slide Time: 25:06)

Short-Term Memory

- 7 ± 2 Chunks of memory can be kept in mind at a time and combined to make a decision.
- The size of the chunk varies greatly between experts and novices.
- Experts can combine many memory units to a whole (e.g.- master chess players retain a series of moves)

Now, the size of the chunk varies greatly between experts and novices . Especially if you compare now let us say children, then they try to memorize number, telephone number, the ten digit mobile number for instance, they usually do not show the tendency of now making chunks of 3 or making chunks of 4, but gradually with little more experience we all start doing that, even children start doing that, but even though we might have grown up, if you take adults, who are not say chess players and compare with say chess masters, you would realize that chess masters have much better memory and then use span of memory like anything because they have to retain a series of moves.

So, you need a very good storage system that helps you recollect what was the step that your opponents had taken in a series and this will help you anticipate what could the probable movement of your opponent if you make this type of move and again studies show that experts can combine many memory units into a whole if they are master of that very field compared to if somebody is just beginner.

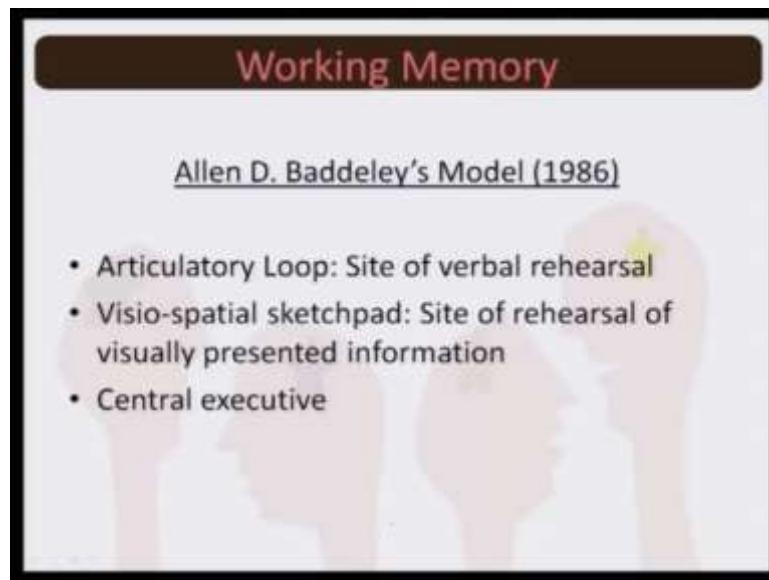
Another interesting concept that was introduced to short term memory was the concept of working memory given by Allen Baddeleys Model. Allen Baddeleys model talks about 3 things - Articulatory Loop, The Visio-spatial sketchpad and the Central executive.

(Refer Slide Time: 26:50)

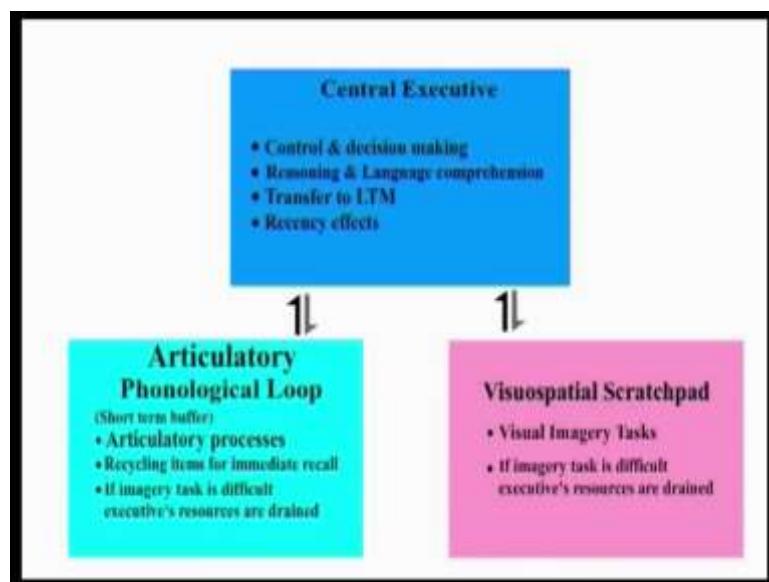
Working Memory

Allen D. Baddeley's Model (1986)

- Articulatory Loop: Site of verbal rehearsal
- Visuo-spatial sketchpad: Site of rehearsal of visually presented information
- Central executive



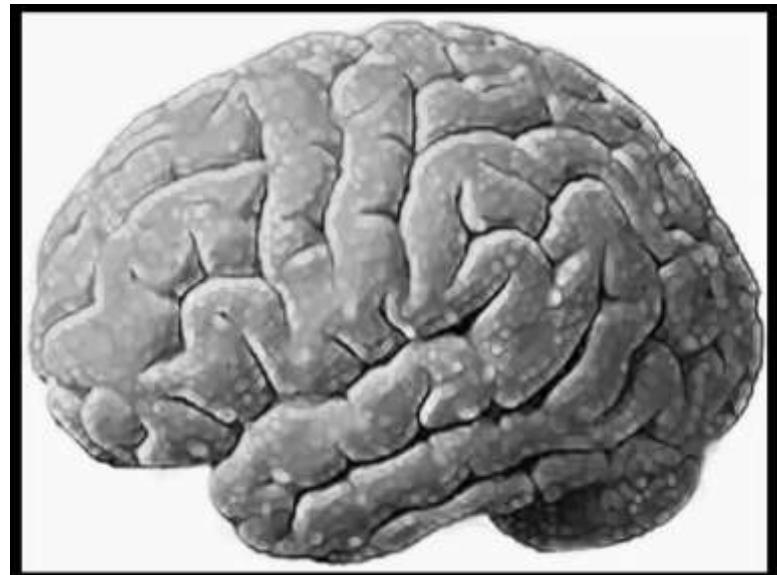
(Refer Slide Time: 26:57)



Allen Baddeley's model of working memory comprises of 3 things, Central executive, Articulatory loop and Visuo-spatial sketchpad. The central executive as a control over things and plays role in decision making, Reasoning, language comprehension and transfer of information to long term memory are the tasks that it controls. Recency effect also a function of the central executive. The central executive depends upon articulatory loop it is also known as phonological loop. It is the short buffer where verbal rehearsal takes place. The articulatory loop recycles items to facilitate immediate recall. The central executive also depends upon Visuo-spatial sketchpad, it is also known as Visuo-

spatial sketchpad as I told you and it has do with the rehearsal of visually presented information.

(Refer Slide Time: 28:00)



This animation shows you the location of working memory in the brain. This is the area twelve of the brain and is responsible for object related working memory. Close to it is area 47 which is responsible for face working memory and this is area 46 and it is responsible for special working memory.

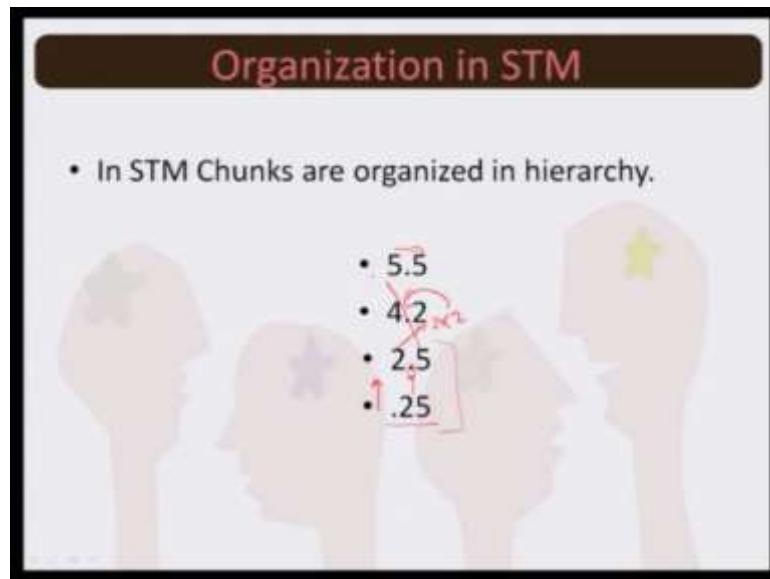
(Refer Slide Time: 28:27)

Working Memory

- Working memory consists of several subsystems for various types of tasks rather than a single general capacity.
- Working memory in a specific skilled activity increases as one aspect of acquired skill.

Now, working memory basically consists of several sub systems of various types of tasks rather than single general capacity. A working memory in a specific skilled activity increases as one aspect of acquired skill.

(Refer Slide Time: 28:40)



What is also very interesting to know is that the information the chunks that we form, they are organized in hierarchy in the short term memory. If you try to disorganize it then storage becomes problematic.

Now, you see your screen. You see 0.5. 5 the moment you go up, you realize that the decimal place has changed now it becomes 2.5. Now you can use different strategies to memorize this information, but one interesting thing could be that you realized that the first number was 0.25, then you realize that this moved up and the decimal position changed. So, basically you remember only one set with repositioning of the decimal point and then you say that this very information, this is how it moves. So, 2 moved to the third position it became 2 into 2 which was 4 and this 5 moved to the top and this was repeated. Now you just organize things like that and then you realize that remembering this information is not at all difficult, but if you do not organize information in the hierarchical order recollecting it becomes very difficult, retaining it becomes difficult.

So, whether it is elaborative rehearsal whether it is maintenance, both will have problem. Maintenance of course, you will have problem because the numbers are not, what we

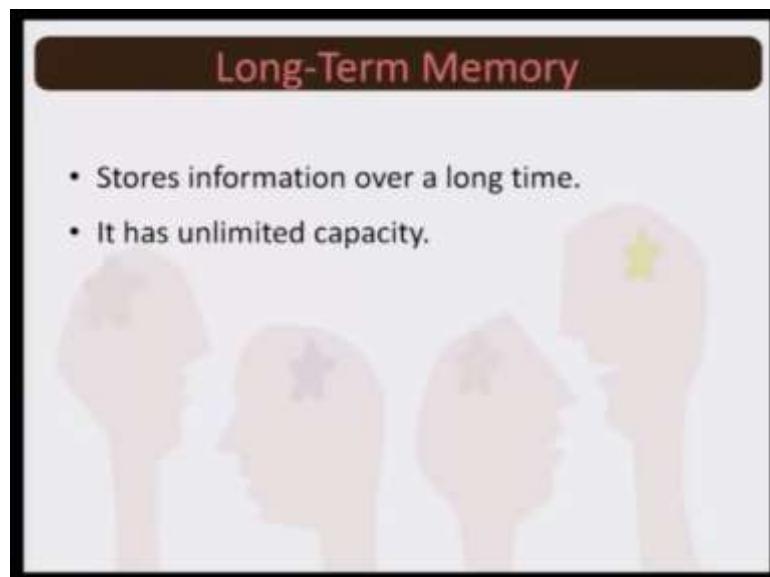
call arranged in hierarchy rather they are more random based. If you go for elaboration then elaboration by default when it try to make it little more meaningful thereby try to arrange it in hierarchy.

So, with this we have completed our discussion on short term storage when we meet next in our third lecture we would be talking about long term memory.

Lecture - 19
Memory Long term Memory – Episodic Memory

Now that we have discussed sensory and short term memory we would now exclusively focus on long term memory.

(Refer Slide Time: 00:27)

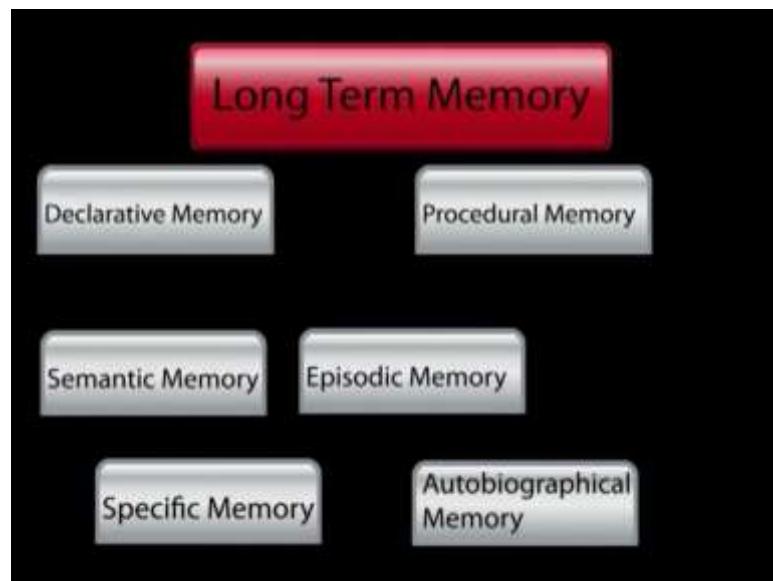


Long term memory basically refers to the fact that the information is stored for very very long period of time. Remember the terminal duration for short term memory was 30 seconds. So, if you are able to store the information and retrieve it even after lapse of 30 seconds time that means, the information has now traveled to long term storage. In terms of sensory memory and short term memory we did talk about the capacity what would be the maximum capacity of this specific memory type. We said 11 to 16 items in the case of iconic memory, similarly we said that fine even if you try to chunk the information at maximum of 40 bits of information can be stored in short term storage.

In terms of long term storage there is nothing like the maximum possible limit of the

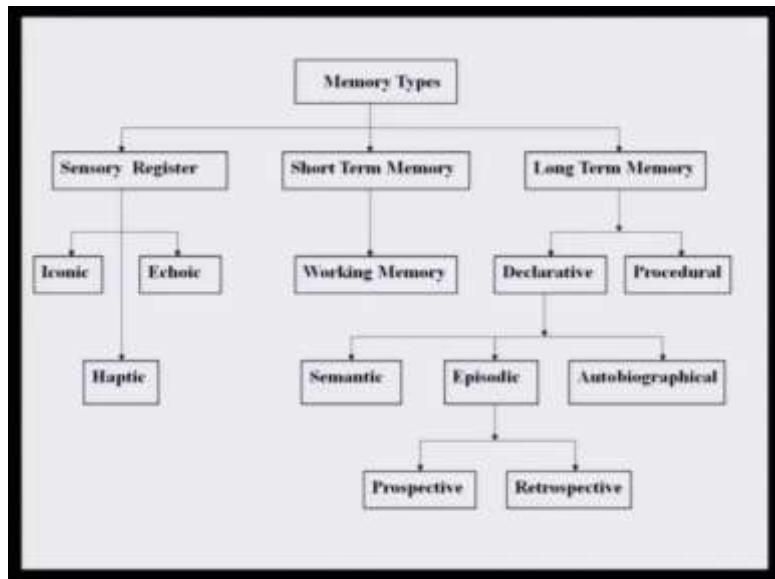
long term storage, unlimited storage for any period of time that is the most vital thing about long term storage, long term memory.

(Refer Slide Time: 01:41)



Now long term memory can be of two types' of declarative memory and procedural memory. And declarative memory can also be divided into semantic and episodic memory. And further episodic memory can be specified as specific memory and autobiographical memory. Based on the discussion that we had till now and if you add little more to what you saw right now.

(Refer Slide Time: 02:21)



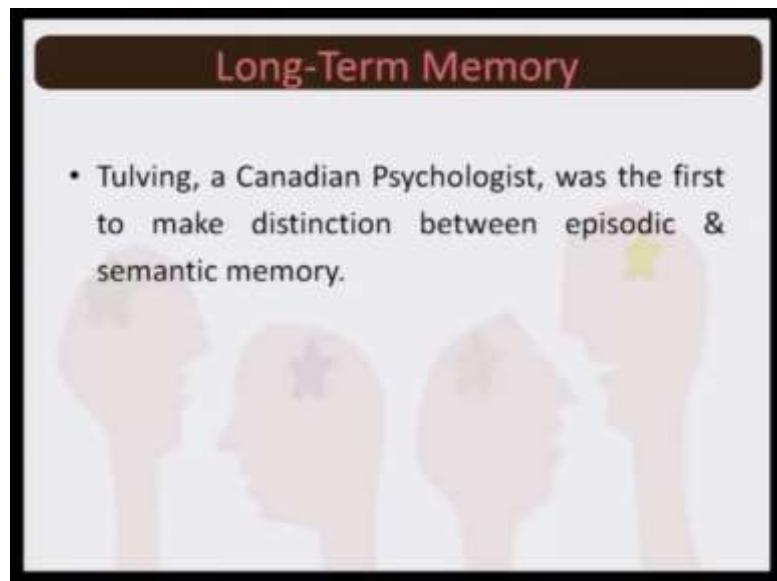
We primarily divide memory into sensory register short term storage and long term storage. Sensory memory we talked about iconic and echoic memory. And we did refer to haptic memory saying that now mostly iconic and echoic memory that has been researched well and therefore we talked about it at length. Within short term memory we also had the discussion about the working memory.

Now, long term memory you can divide it into declarative and procedural memory this we will come to it little later. The other when you look at memory in terms of semantic memory, episodic memory and autobiographical memory. Further, episodic memory can be divided into prospective and retrospective memory. What we would do right know is that we will start with episodic memory and then we will know move towards different different other types of long term memory that we are looking at in the chart right now.

(Refer Slide Time: 03:11)

Long-Term Memory

- Tulving, a Canadian Psychologist, was the first to make distinction between episodic & semantic memory.

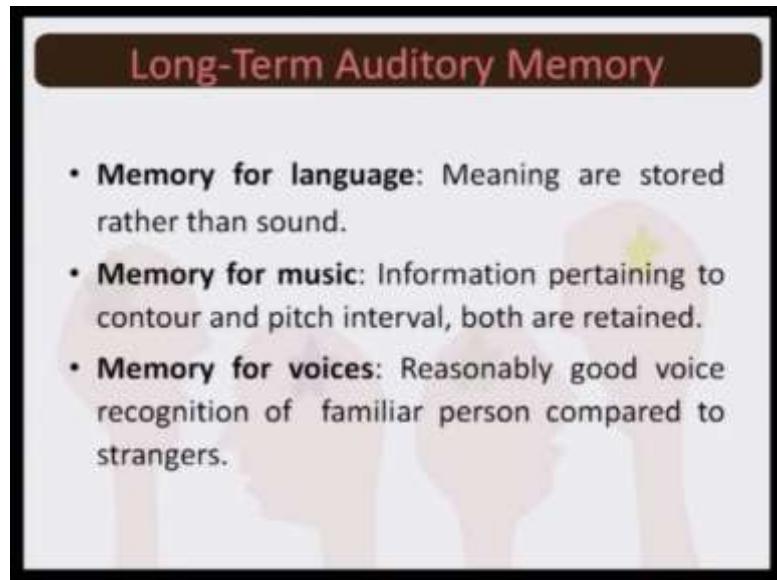
A faint, semi-transparent image of a human brain is visible in the background of the slide. The brain is shown from a lateral perspective, with the left hemisphere on the left and the right hemisphere on the right. The cerebral cortex is visible, showing various gyri (ridges) and sulci (grooves). A small yellow dot is located near the top of the right hemisphere.

Canadian psychologist, Tulving was the first to make distinction between episodic memory and semantic memory.

(Refer Slide Time: 03:19)

Long-Term Auditory Memory

- **Memory for language:** Meaning are stored rather than sound.
- **Memory for music:** Information pertaining to contour and pitch interval, both are retained.
- **Memory for voices:** Reasonably good voice recognition of familiar person compared to strangers.

A faint, semi-transparent image of a human brain is visible in the background of the slide. The brain is shown from a lateral perspective, with the left hemisphere on the left and the right hemisphere on the right. The cerebral cortex is visible, showing various gyri (ridges) and sulci (grooves). A small yellow dot is located near the top of the right hemisphere.

Now, if you look at the way information is stored and the way the information is recollected you will find very interesting thing about human beings. We have very good

memory for language, we have very good memory for music, and we also have very good memory for voice.

Now, memory of language would primarily mean the storage of the meaning rather than the sound. In term of music information pertaining to contours and pitch interval both are found to be retained in our long term storage. In terms of voice reasonably good voice recognition is possible for us. When we come across familiar people, but for strangers we do not have such good voice memory. Say for instance, if you hear the calling sound of your parents, if you hear the calling sound of one of your siblings, you would very easily find out recognize just on the basis of voice that this is the calling sound of my father or my mother or my brother or my sister, because we have very good memory for voice of familiar people. Listen to this very music.

(Refer Slide Time: 04:45)



Look at the clip to see and actual attempt by a child to memorize a poem. The video that you saw right now presented mother making her child learn to sing a nursery rhyme. Now child was basically picking up the contours and he was trying to copy the melody even though the exact word was not known to him and this was of course meaningful for the mother, but it had no meaning for child except for he was enjoying the music the rhythm that he was trying to imitate.

Now, after the lapse of this episode when the child was grown and mother was asked to narrate some of the significant moments that she remembers about her own child, she could exactly remember the words that this child used to use. She especially had a recollection about this very episode wherein she said that how the child used to sing and what type of words he used to use and how he is used to repeat imitate the rhyme.

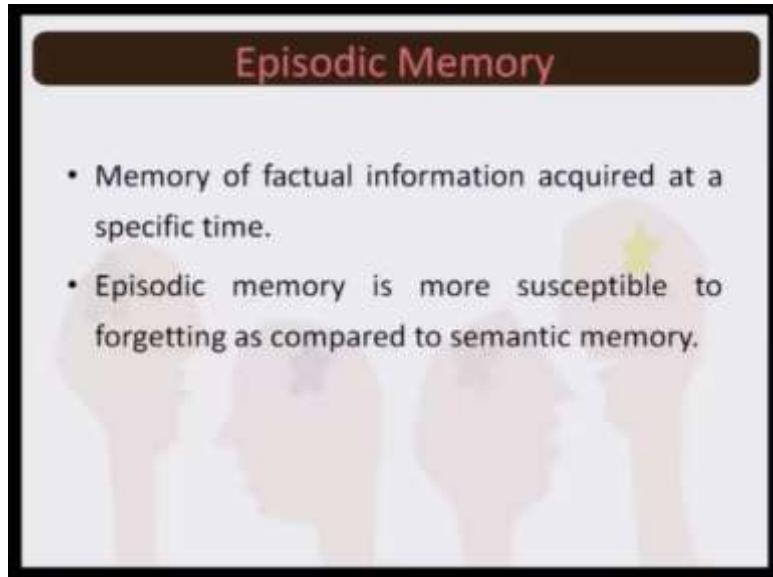
So, this is fantastic thing about the human memory system. We have very good recollection of the voices, the music, the language and depending on the personal significance of this issues our memory become very very very good for this episodes. Now episodic memory represents experiences and it is basically a memory of events, but these event are recollected in a serial from. It is just like a television serial which is broken into several episodes. So, we have the record of our past experience and all these daily experiences of the past they are broken into episodes. Therefore, it is called as episodic memory.

So, when you recollect you say I still remember my first day in school. I still remember when I delivered the first lecture on camera; these are episodic memory.

(Refer Slide Time: 08:20)

Episodic Memory

- Memory of factual information acquired at a specific time.
- Episodic memory is more susceptible to forgetting as compared to semantic memory.



Episodic memory basically also is the factual information that is acquired at a specific

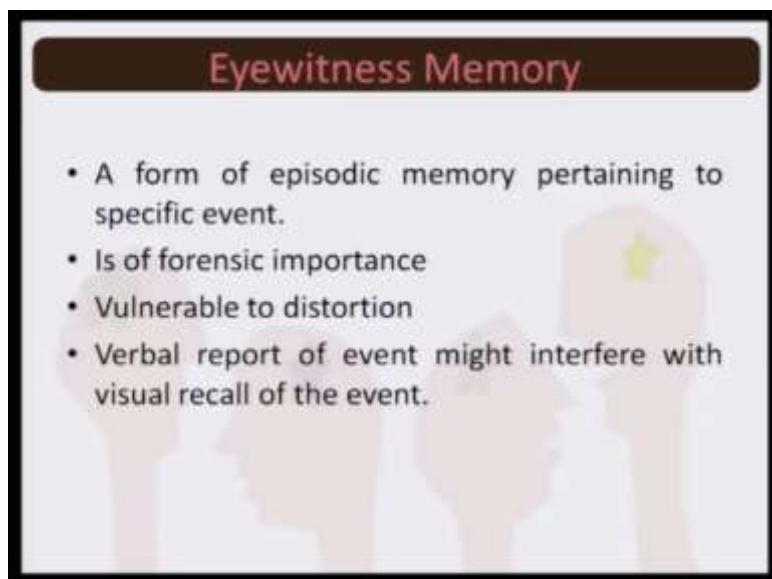
time. So, remember time plays an important role here, it becomes an anchor here. Therefore episodic memory is more susceptible to forgetting as compared to semantic memory, because in the case of semantic memory it is meaningfulness that is given utmost importance, whereas in the case of episodic memory it is the fact at specific time that is given importance.

Therefore, even in terms of recollection we do commit certain errors. Right now we will see one of the those examples; if one is asked to recollect and reproduce fact related to particular event that had happened at a specific time period we do go ahead with distorting it. So, part of it is recollection but we realize that whole lot of distortion does take place in recollection of episodic memory.

(Refer Slide Time: 09:29)

Eyewitness Memory

- A form of episodic memory pertaining to specific event.
- Is of forensic importance
- Vulnerable to distortion
- Verbal report of event might interfere with visual recall of the event.

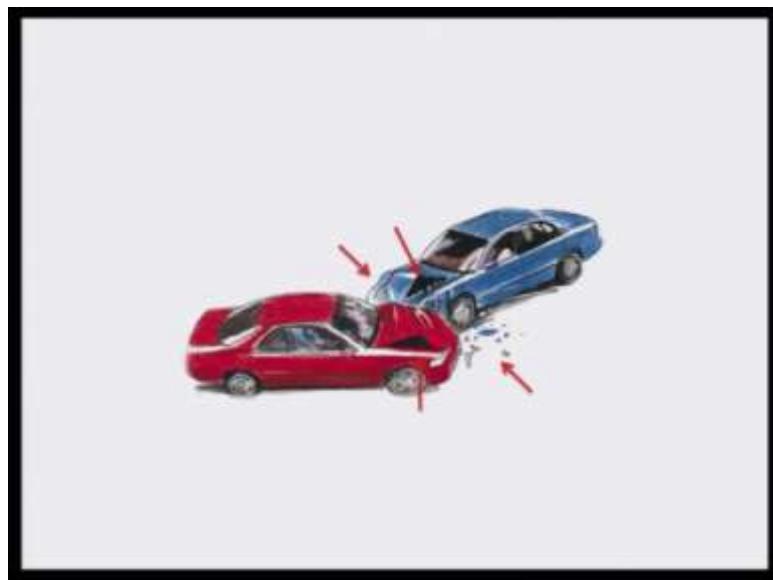


One form of episodic memory is called eyewitness memory, it is called eyewitness because it has forensic importance. You must have heard this word there is somebody who acts as a witness in the court of law. So, you provide evidence, you endorse of the happening of something therefore it is called that you are testifying it you are becoming a witness to it. So, when recollection of information which is basically an episode at a specific time period if it serve the forensic purpose then it is called Eyewitness Memory. And of course, it is because one of the forms of episodic memory so it is also vulnerable

to distortion.

Usually, the verbal report of event might even interfere with visual recall of the event. So, what you usually recall when you replay the event the sequence and you verbal translate it to report it there could be little bit of a interference effect there itself

(Refer Slide Time: 10:40)



Look at this very image on your screen, image you are standing at one of the locations on the road and you see collision between two cars. Usually, if two cars are moving at a very high speed the overall time that the entire process of collision takes place would be fraction of seconds not even one second would be complete when this car will come and hit each other and whatever would had to happen would happen.

Now, imagine yourself that you are standing at a specific location from where you saw this accident. So Focus yourself on this screen right now, see what actually gets distorted. After the lapse of certain period of time you are asked to recollect what you actually saw. Now you see, when you construct when you mentally replay the story what you saw was this but when you mentally replay it you add certain flavor to it. Now all this arrows show this are the addition that you have made so as to suit the recollection make it much more accurate, but while trying your best to make this story far more

accurate actually what you have done is that you have distorted it. This is an interesting aspect of eyewitness memory.

(Refer Slide Time: 12:23)



November 26, 2008 would always be remembered in the history of India because of what is called as Mumbai attack or 26/11. When hotel Taj one of the sites in Bombay became the target of terrorist attack.

November 26 2008; now, that this episode took place in hotel Taj let us look at this event from two viewpoints; an NSG commando who participated in this event in the anti terrorist movement operation that was held in hotel Taj, how he recollects the information. And somebody who was part of it and got a chance to come out of the hotel, how he recollects the information. This is pure demonstration of episodic memory. That specific time when you were in hotel Taj performing the commando operation, what happened to you listen to this.

(Refer Slide Time: 13:45)



Mr. Amit the manager of Shamiyana restaurant in hotel Taj also was a witness of this episode. His episodic recollection varies from recollection of the commando whom you heard right now, because although time was the same the episode that was taking place for Amit was different from what took place for the commando. Listen to what Amit had to say later on.

Besides hotel Taj CST station in Bombay also was one of the sites where the terrorist had attacked and killed lot many innocent people. Sebastian De souza the photo journalist was available at that time, he was present there he clicked numerous photographs and it was through the lens of Sabestian Dsouza that next morning whole lot of Indians they realized what actually happened at the CST station. Now when Sebastian Dsouza was taken back to CST station and was asked to recollect the episode that took place that evening this is what he had to say.

We are taking lot many examples because we want to understand how episodic memory works. Remember one thing we have discussed that it is time specific, two we have discussed that it event specific. So, event anchored to a given time and then you store it because of the significance that you attribute to it. These are all rare examples, the example of terrorist attack that you took all of them where rare.

(Refer Slide Time: 20:24)



One such rare experience I will also like to show it to you on 22nd May 2010 6:30 in the morning Air India Express flight 812 from Dubai to Mangalore met an accident at Mangalore International Airport. Only eight passengers survived; two of them later on recollected their experience look at this.

Now, what actually you saw here was amazing. The way two passengers who had a very narrow escape who defeated death could actually recollect the tilt of the flight, the jerk that they felt when the flight did hit the ground and what actually happened. They were sitting inside the flight, and they visualized, they recreated the whole sequence of events what actually could have happened there. These are the examples of episodic memory. And of course, these were all examples we all know because they were historic events from the history point of view.

But you recollect your own life experience and you would realize that you would have thousands and thousands of such episodic recollections, because you provide certain specific significance to it. Therefore the whole lot of factors affects episodic memory. First one, of course the significance of the events; besides that amount and space of practice, how much amount of practice has actually gone into storing this very information. If you have practice something more and more the chances are that you

would recollect it better. If there are competing events temporarily two event significant events take place at the same time, what is the temporal gap between first and second event that would also play a role. If both are equally significant and temporarily there is not much of the difference there could be interference. If there is distribution pattern, one event took place at this time and other event took place little later then you get time and space to practice this information and reserve it in the episodic memory.

Second very important thing is the type of processing. You heard Mr. Amit right now when he said towards the end of his interview that life after 26/11 is a grace period for him, this is how he interprets. So, how do you process the experience that is important? The way he process will decide how much of recollection you will have and the level of accuracy with which you will be recollect the information.

Three and more important is also the fact that how do you cue the information that you are storing. It is equivalent to something like giving a file name when you save file in your PC. Say for example, if I have an event today's date I give it as a file and I know that my search will be always be using the date. So, if I have to find out what happened at this point in time I just search for the file name that has to do with this date, there could be a situation if I give a file name not by date, but by event. If I have a seminar, whether I have a class, whether I am going for some other invited talk give different file names.

Similarly, say I am sure when you store photographs on your PC you create a folder and you give name to the folder. For example, if you have gone to say any tourist place, say you went to Agra you make a folder named Agra. You came to Kanpur and give a folder name Kanpur. Photographs of Agra are stored in or the folder Agra, photographs of Kanpur are stored in the folder named Kanpur. And this is relevant cue that you are giving to yourself because next time if you have to look at the photographs that you clicked in Agra you will go for the folder which has the name Agra.

All episodes whether it is the code that you give is the time and you say I remember when I was at CST station in the evening at this time waiting for this very train which has the departure time at say 6 o clock and 5:58 was the time when this accident took

place, when this episode took place. So, this walks as a retrieval cue. Better and more efficient the retrieval cue far more the better it would be and convenient it would be for you to recollect the event. Also information the recollection will be very very accurate because retrieval cue is correct.

Of course, we have been talking about significance. So, episodic memory is bound to be context dependent. In which context did this happen. So, when you recollect the information in what context are you trying to recollect the information? So, if there is a match in the context, in which it was stored and in which you are trying to retrieve. More and more is the match between the context; higher is the probability that you would recollect it better. And of course, besides context it is also the state which plays a role. So, retrieval of state memory is also the state dependent.

In what mood state you are when you experience this. So, you were at a given point in time on the station when the terrorist attack took place and when you recollect the experience it is also the state in which you are. The emotional arousal that you experience at that time later on when you are about to you are told to recollect your emotional arousal also plays an important role. Experience, the emotional experience at that time the emotional experience at this point in time; how charged you were there at that point in time and how charged you are at this point in time. If these two overlaps, it will work as a fantastic retrieval cue.

So, what we have discussed, event specific time specific; so event at a given time recollected as one segment forms the episodic memory. We have seen good number of examples of episodic memory. The time of practice, the space between two events that take place, how much of processing, how we try to store the information the file name that we try to give and of course the state and the context in which event happen and in which the recollection is being made. So, these are the prominent factors that affect episodic memory.

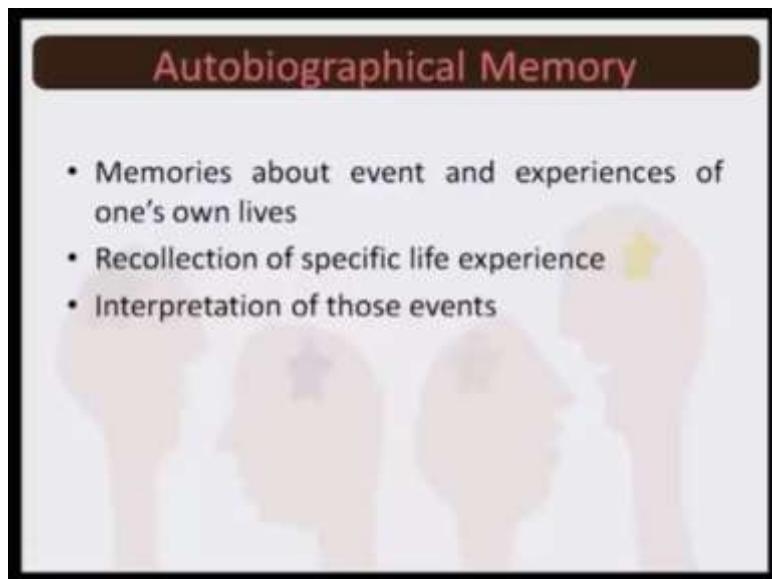
Key words - long term memory, episodic, eyewitness, semantic

Introduction to Psychology
Prof. Braj Bhushan
Department of Humanities and Social Sciences
Indian Institute of Technology, Kanpur

Lecture - 20
Memory Long Term memory- Autobiographical & Semantic Memory

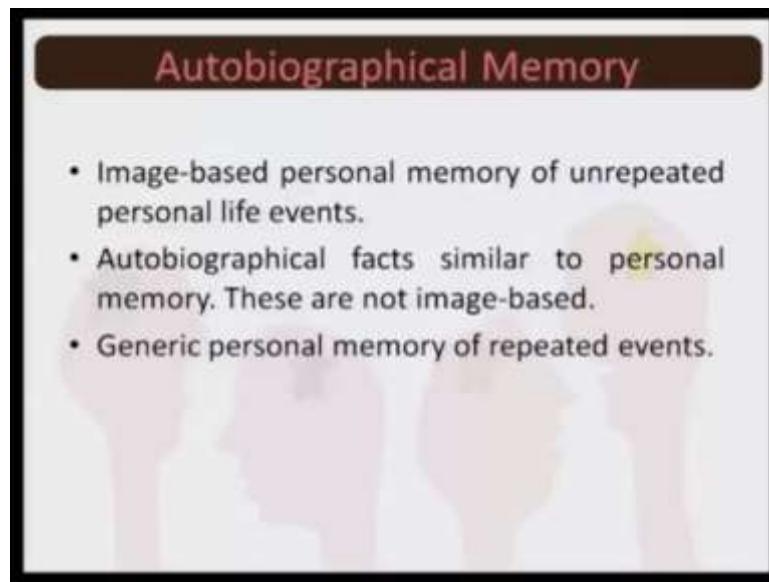
Let us now, come to another form of episodic memory, what is called as autobiographical memory as the name itself suggests autobiographical memory has to do with events or experiences of one's own life.

(Refer Slide Time: 00:27)



So, what happens when we have certain recollection of a specific life experiences, when you interpret them and you considered these are the events and experiences that defines you your life. So, it somewhere like your personal life narrative that constitutes the autobiographical memory.

(Refer Slide Time: 01:01)

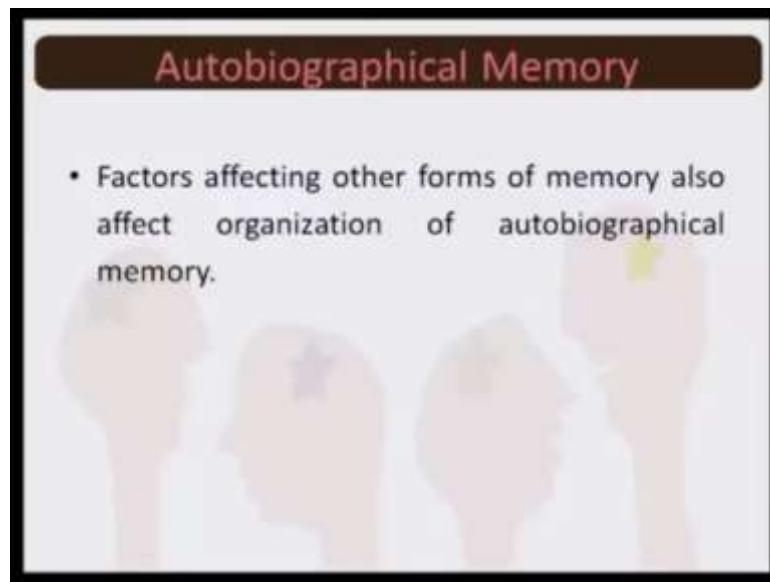


Usually autobiographical memory has the imaged based personal memory of unrepeated events of the life of the individual, but there is also a possibility that it might have facts similar to the personal memory; however, in this case it would be not imaged based and therefore, the generic personal memory of the repeated events that can also become a part of autobiographical memory.

So, one, we have the un repeated personal events something that happened only ones, but it was extremely significant for the individual concern and you have a very clear image based personal memory of it one single event highly personally relevant, and you know that such events will not be repeated in life likelihood is very little because of it, uniqueness still we have the image based personal memory of it the second aspect what we discussed was that there could be non image based memory also of facts that are similar to personal memory.

And third we also discussed there could be repeated events of the generic personal memory and therefore, when I remember my name, the name of my parents other members of family, friends, their family members and many of those things which has connection to the self they are considered as part of autobiographical memory.

(Refer Slide Time: 02:41)

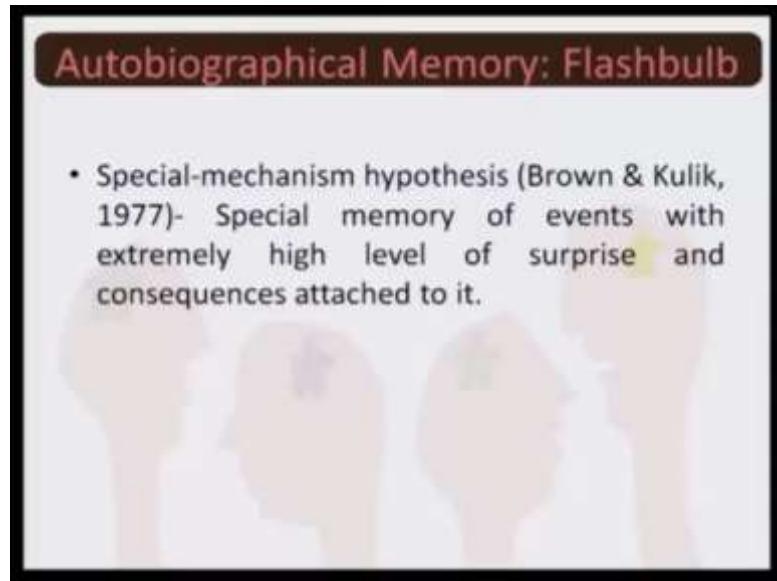


And therefore, the factors that affect other forms of memory they are also suppose to affect the organizational process of autobiographical memory one interesting thing you will find in autobiographical memory what is called as infantile amnesia. Amnesia Of course is not the normal sequence of forgetting of events it is a disorder, but infantile amnesia is considered to be perfectly normal what happens in this case.

Let us take of our life event and then try to understand what actually this means, if I ask you to go back to your earlier periods of life and recollect event, significant events till whatever period you can go back to and usually majority of us will have a recollection of some of the significant events say when you are 5 years old 4 years old, but only significant one's many day to day experiences will not to be recollected simply because we have cross substantial period of time from that various stage.

Therefore, the life events in the first few years usually up to 3 years the chances are we as human beings we forget we completely forget and even there after although we have a memory of it we have re-collection of only significant events not everything this very inability of us not to be able to remember of events of the first 2, 3 years of life is called infantile amnesia because it has to do with the earlier period of life. Therefore, it is called infantile amnesia is of course, forgetfulness, but remember in infantile amnesia is not at all considered to be abnormal it not a pathology although we find a word amnesia.

(Refer Slide Time: 04:53)



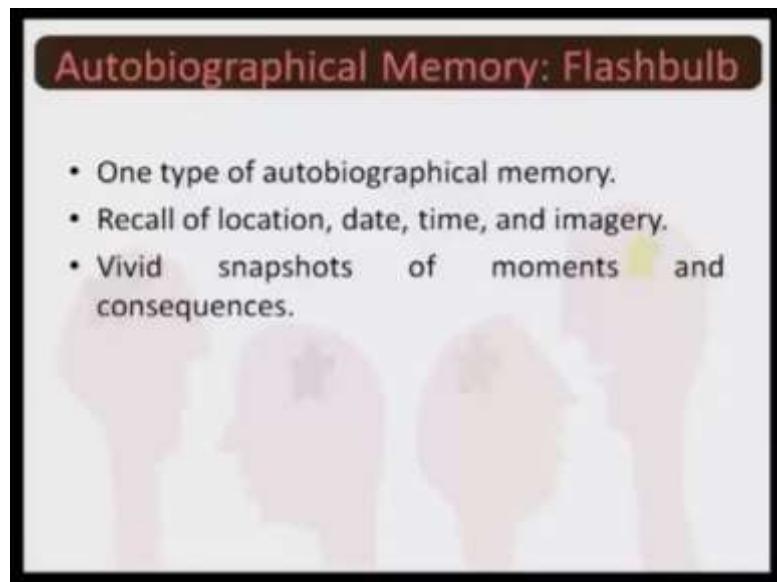
And interesting aspect of autobiographical memory is what is called as flash bulb memory there is you know a mechanism is called special mechanism hypothesis is brown and Kulik brown and Kulik they proposed hypotheses called a special mechanism hypotheses which says a that special memory of events which has extremely high degree of surprise and consequences attached to it, they have a better memory.

So, if there is something which has heightened degree of surprising embedment to it or the consequence was something that is unforgettable the chances are let we will remember that is specific movement and that is called as flashbulb memory now flashbulb memory is basically just one type of autobiographical memory.

(Refer Slide Time: 05:32)

Autobiographical Memory: Flashbulb

- One type of autobiographical memory.
- Recall of location, date, time, and imagery.
- Vivid snapshots of moments and consequences.

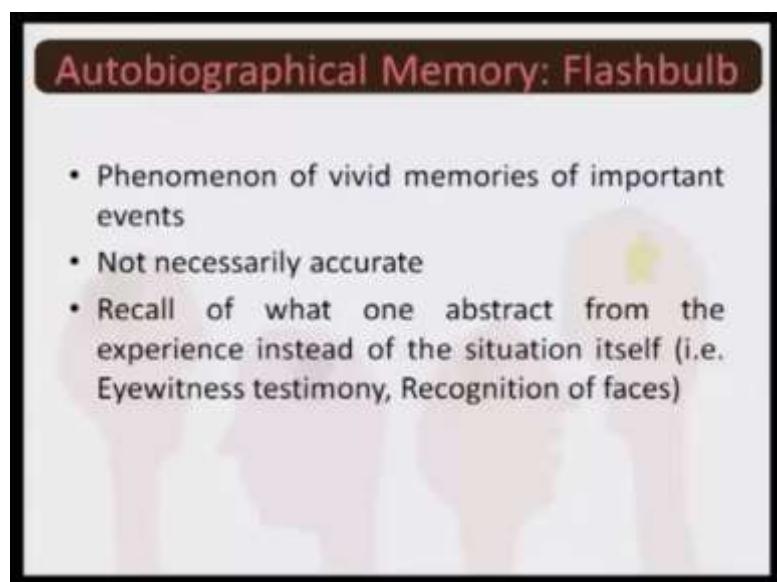


Now unlike the episodic memory that we discussed especially the eye witness memory in flash bulb memory it is basically recall of location date time and imagery and what do you have we have a vivid snapshots of the moments and consequences. So, surprise has to be there the consequences has to be there and therefore, where did it happen what time what was the date and the image which is base on snapshots of the sequence of the event that what constitutes flashbulb memory.

(Refer Slide Time: 06:16)

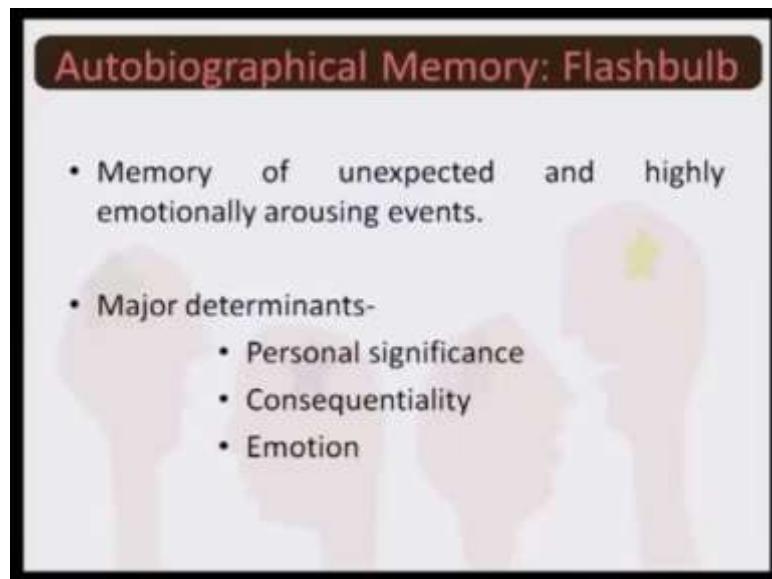
Autobiographical Memory: Flashbulb

- Phenomenon of vivid memories of important events
- Not necessarily accurate
- Recall of what one abstract from the experience instead of the situation itself (i.e. Eyewitness testimony, Recognition of faces)



Therefore flashbulb memory as phenomenon of vivid memories of important events, but once again just similar to eye witness memory, it is also proven to distortion therefore, need not be accurate in nature.

(Refer Slide Time: 06:35)



Usually in flashbulb memory it is expected that you will always have memory of something which was unexpected therefore, there is an element of surprise here and because surprise is one of the basic emotions therefore, the unexpected surprise come into that very event also emotionally arouses you. So, therefore, the event has high degree of emotional arousal attached to it and therefore, it becomes a part of flashbulb memory.

Three things are important for flash bulb memory one the significance of the event how the personally significant the event is to you 2, what was the consequence. So, more dire the consequences the higher the chances will be remember why because things which as higher consequences dire consequences will you know induce a high tend of degree emotional arousal within you. So, these three things becomes major determinates for flashbulb memory.

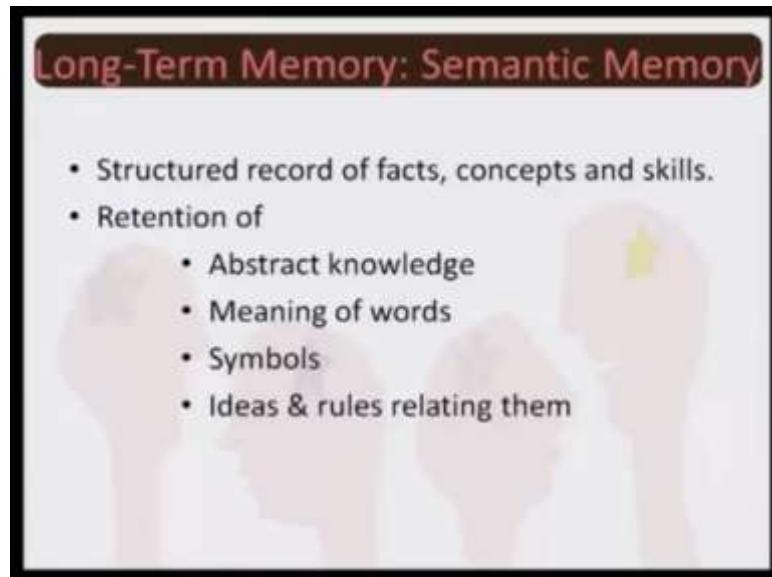
Look at this sick lady who experienced violence twice in her life once, in nineteen forty seven she was young and India was divided into two-half's India and Pakistan and again in nineteen eighty four when the anti-sikh riot took place in India [FL]. One of the national geographic programs, one Vietnam war photographer is introduced he was

shown his own photographs and asked to recollect rethink years after the passage of the war what actually was taken place what happens to him. Look in this video.

I feel it. So, how pretty sad make this pictures is very difficult when you took this pictures and do you have this pictures [FL] [FL] this is a heart hitting picture [FL]. Now if you look at these two videos in the first case the women in at position to recollect her experience what time of the day what did the police men say and making a comparison between the two experience of communal violence.

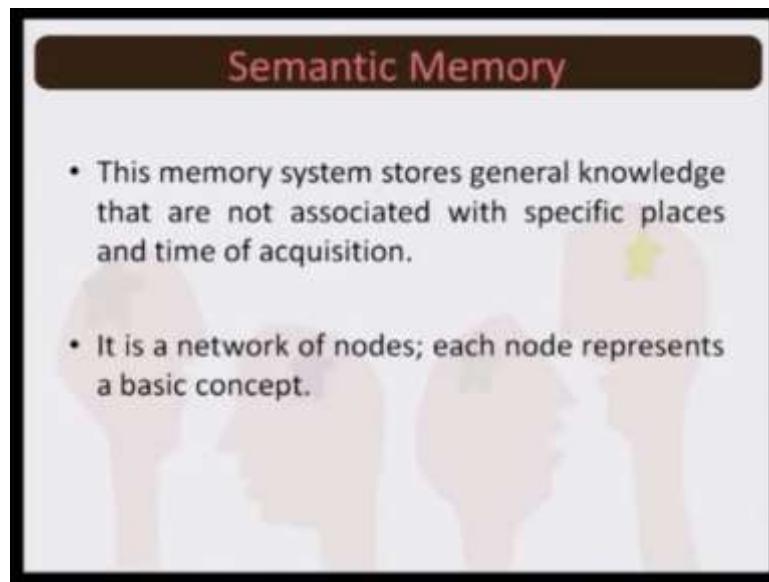
In the second event, although this photographer considered the event to be significant event to recollect when he reexposed to his own photographs the consequence of the war the emotions over powers his memory. Therefore, the three things which we discussed right now the personal significance of the event the consequence of the event and then the emotional arousal attached to the memory of the event, these three things become extremely important as far as flashbulb memory is concerned. Having discussed episodic memory the flash bulb and testimony, we shall now discuss semantic memory semantic as we referring to it means meaning fullness therefore, the structured record of facts the concepts the skills these constitute the semantic memory.

(Refer Slide Time: 11:53)



So, it is basically the retention of the abstract knowledge meaning of the words symbols ideas and rules that govern there.

(Refer Slide Time: 12:10)



So, this memory system basically stores the general knowledge that are not associated with specific places and time of acquisition remember in the case of episodic memory time of the event a consequence the location these were important parameters on the bases of which the whole sequence of which event was broken into episodes. Given what you call that association with personal significance and with the forensic significance we further divided into sorry with eye witness and flash bulb memory whereas because semantic memory as to do more with the concepts the rules that are governed the words that are represent them. Therefore, they are supposed to be basically free from the time of acquisition and the place, the location in which you learned this.

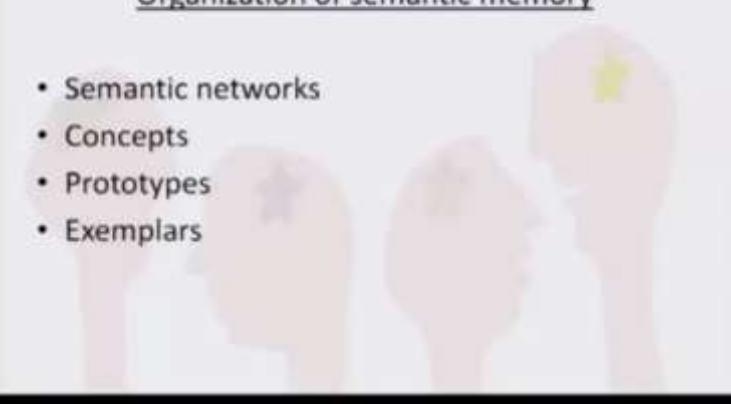
Therefore basically what happens here you have a network of nodes and each of the nodes, they represent the basic concept the more and more you spread the network higher and better is your semantic memory, the much better is the understanding of yours with respect to that specific concept.

(Refer Slide Time: 13:44)

Semantic Memory

Organization of semantic memory

- Semantic networks
- Concepts
- Prototypes
- Exemplars



There are four important things in semantic memory, they play important role in organizing the content first is the semantic network we talked about nodes and network that is formed we will talk it about again. So, semantic network concepts, the prototypes and the exemplars. So, we will talk about all four of them 1 by 1.

(Refer Slide Time: 14:04)

Semantic Memory

- Semantic networks: It is the knowledge representing meaningful relationship among concepts.

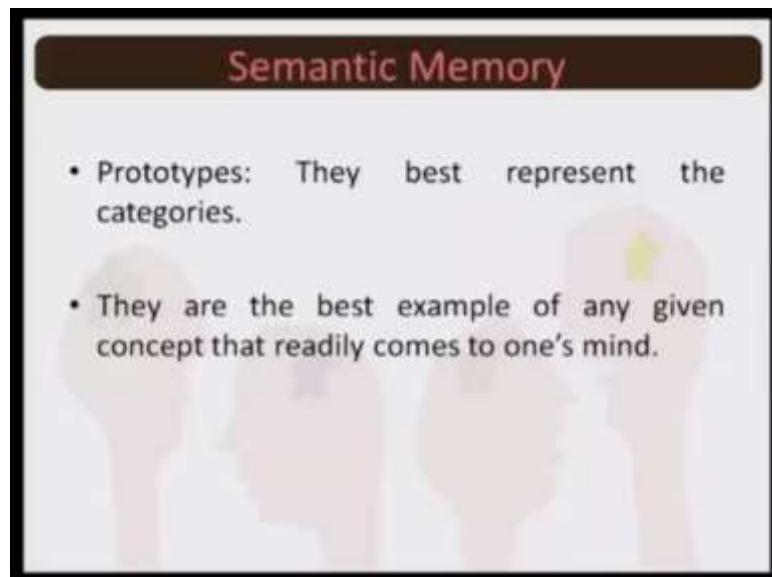


Now, semantic network is nothing but it is basically knowledge representing meaningful relationship among concepts. So, when you think of an animal, the moment you think of animal you consider at animal by default means let it would be living because we have

understood to classify world in terms of living and non living creatures. Now you think if it is say, living then it will definitely which could be a mammal you think of one good example of a mammal, which is an animal, you think of sheep the moment you think of sheep you think it has fur the moment you think of you think other animals also have furs. For instance you think polar bear you connect polar bear is also a mammal which is also animal and the leaving creature polar bear the live on. So, this is how the network expands you have nodes, each node representing an important concept and then you start spreading the network the more and more holistic is the network that you derive and the interconnection let you establish between the different notes the more and more better is your semantic memory.

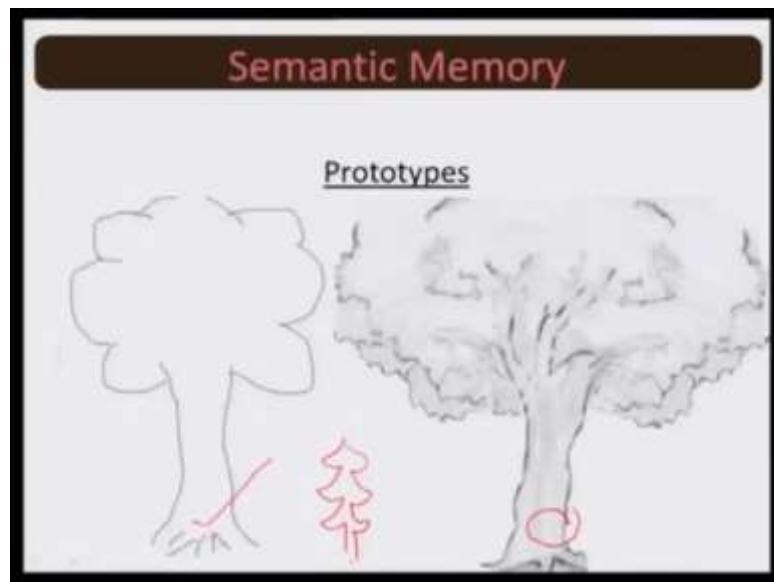
What are concepts? These are nothing, but simple mental categories that are used in organizing the objects or events. So, you think of an object you think of an event and therefore you form a mental category, that is called concept.

(Refer Slide Time: 15:50)



Now, prototypes are the best representatives of these categories. So, they are basically the best examples of any concept that comes to your mind the moment you think of that every concept. Think for instance you are told a word tree, the moment you hear the word tree a representation comes to your mind a mental representation.

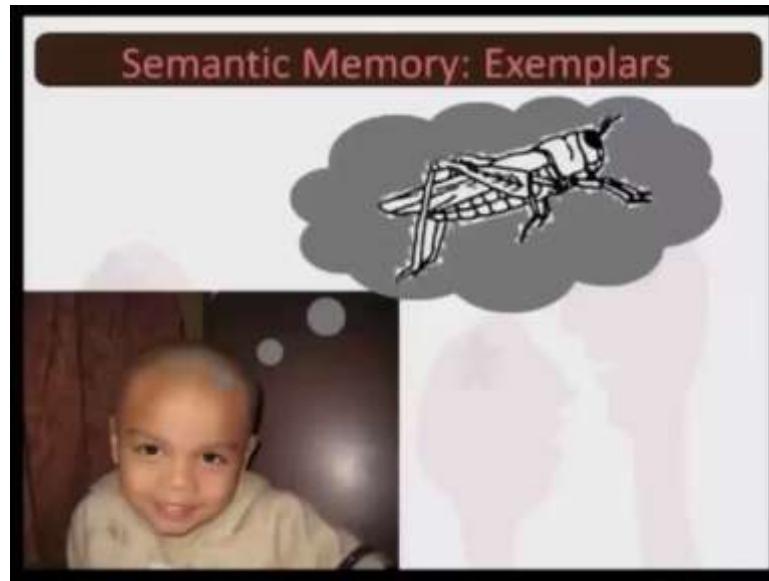
(Refer Slide Time: 16:19)



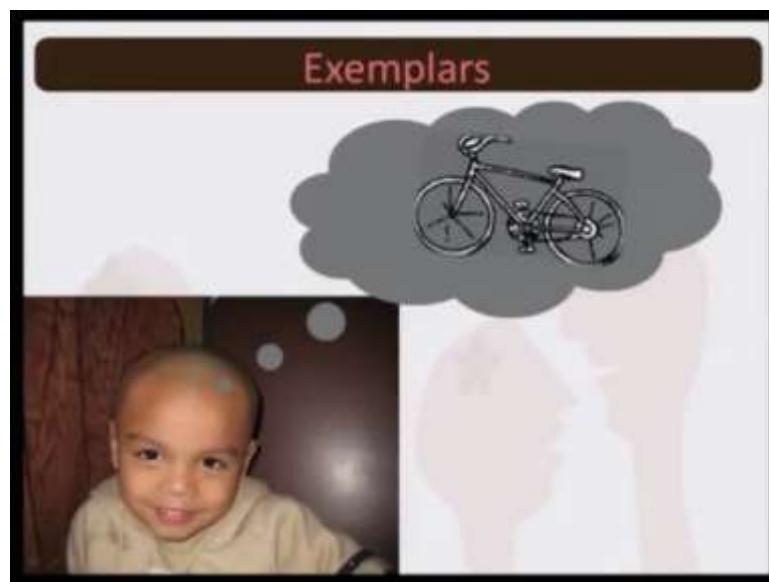
Now, look at your screen in mostly likely wood the line driving at your see of your tree is perhaps the image that you have draw. I have performed this exercise several times in the class room and let me share one thing with you most of the students in the class where I have tried this example who are from northern part of India they usually have know the representation of tree like this actually you have something like this, this very example, but then some of the students who are from the extreme northern side, the mountain area they usually know the they have something like this. So, depending on what type of exposure you have, what type of experience you have of a tree you will have the readymade example the image of that very concept. So, what is called as prototype. The category is told to you and the best example that come to your mind that represents that very category.

Now, tree could be of any thing banyan tree, pine tree, mango tree any type of tree, but depending on the mostly visible tree in your locality, you develop an example mental image that is a prototype [FL].

(Refer Slide Time: 18:13)



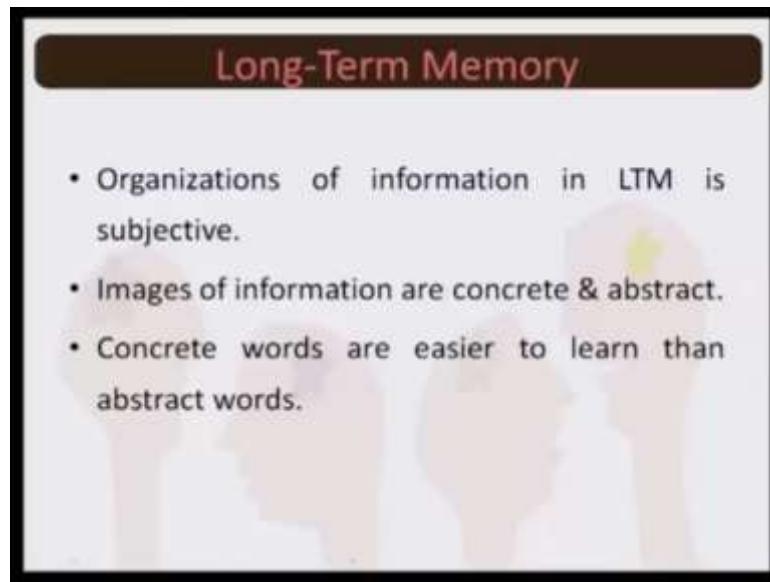
(Refer Slide Time: 18:18)



Now, we come to exemplars, you think of an insect and you have a grasshopper in your mind. So, you think of a bicycle, a mode of transport and something comes to your mind. So, these are again the best example of the exemplars, what happens in the case of exemplars these are once again the best examples that would come to your mind. Now what we have discussed we have the nodes that represents the concepts each of these concepts are interconnected to several other concepts which basically helps you form a network to represent a concept we have a prototype and we have the best example that would try to explain the concept for yourself so that when you look at certain

phenomenon in the world using your semantic network you can think of whole lot of things remember that things are not so crystal clear and things are not presented in isolated way we have discussed here in the example, but then we have to simplify it for our understanding as a living being we cannot live in a complex system where most of the things are you know, you are not capable of interpreting them and therefore, semantic networks plays extremely important role here.

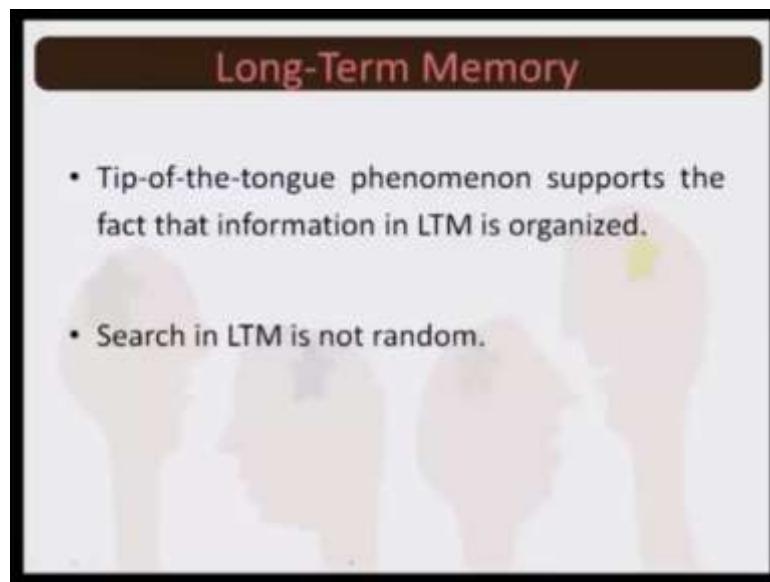
(Refer Slide Time: 19:46)



Now, when we come to long term memory organization of information in long term memory is purely subjective how you would organize it is your choice, is your convenience images of information's can be concrete or it could be abstract. So, if you are told something like say old and if you seen elderly grandparents in your house you will have somewhere an image of what is meant by the word old, if you hear the word brick, if you hear the word pencil, so many of these things will have a very concrete image that it will generate. Many other concepts might not generate concrete images say for instance if you are told you know that there was a king he was very honest. Now, there could be examples of you know what honesty meant, but then honesty cannot create very clear cut concrete image in your mind similarly if you are told that he was a very hard working you can think of whatever type of activity this character was involving in the story and accordingly you can think of, you can intensify the engagement of that individual in that given activity to visualize what it would mean to be hard working in this very scenario.

Similarly if you are told many of those qualifications which are more qualitative in nature like honesty, you have difficulty in creating clear cut images therefore, when we combine these things in long term memory we might have images of the concrete words and we might have certain images which are more and more abstract in nature and of course, because it is like this. Therefore, the learning of, the storage of, the concrete words would be much more easily compared to abstract words..

(Refer Slide Time: 22:18)



Another interesting thing absorbed in long term memory is what is called as tip of tongue phenomenon. Tip of tongue phenomenon basically means that when we store the information and try to recollect it we failed to do. So, although we feel as if things are readily available it is somewhere on tip of the tongue, but it is not making its way out of the mouth and therefore, you are not able to recollect it. So, imagine something like this, snake inside a barrow this is the barrow the snake comes out from the barrow and again it goes down it is something like that you feel as if the event is about to be recollected, you can very easily extract the information from the long term storage. But somehow you keep struggling and you are finally, not able to do, this is called tip of tongue phenomenon and why this does this happen? This basically is a phenomenon which supports the fact that the storage of information in the long term memory is very, very organized. So, if you want to make a random recollection attempt the information will not be viewed be readily available to you. So, if you move in a sequential order in an organized order because information is stored in an organized manner, retrieval

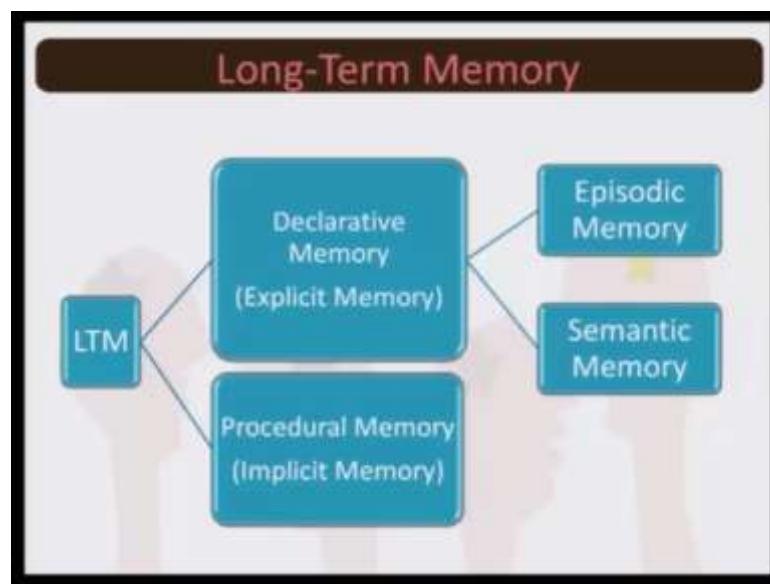
becomes easier because information is stored in the organized manner and you start making random recollection, then you fail to do so.

Key words - autobiographical memory, long term memory, semantic memory

Lecture - 21
Memory Long Term memory-Procedural Memory

Till now, we have talked about episodic and semantic memory which are basically part of the declarative memory it is also called as explicit memory.

(Refer Slide Time: 00:22)

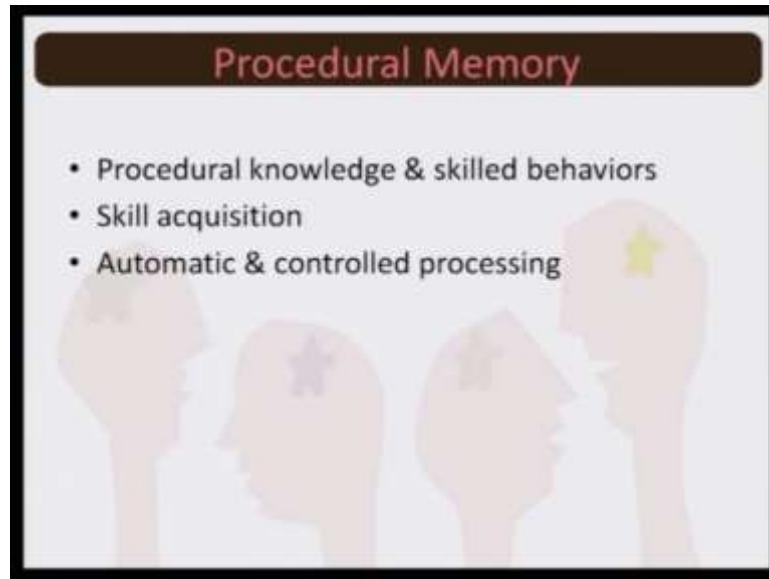


Let us now, come to the implicit sight of memory what is called as procedural memory procedural memory basically constitutes the knowledge of the procedure and the skilled behavior.

(Refer Slide Time: 00:30)

Procedural Memory

- Procedural knowledge & skilled behaviors
- Skill acquisition
- Automatic & controlled processing



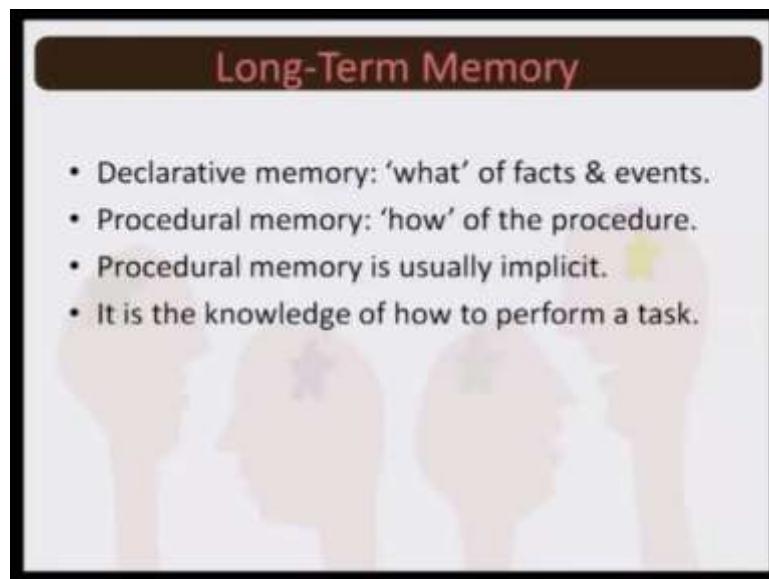
So, when we acquire a skill and gradually we realize that the whole process that we have learnt for a particular type of an operation becomes too automated and we have developed the control we have developed mastery over the process that is called procedural memory.

Now, declarative memory from that point of view, if you see they are basically what of the facts.

(Refer Slide Time: 01:02).

Long-Term Memory

- Declarative memory: 'what' of facts & events.
- Procedural memory: 'how' of the procedure.
- Procedural memory is usually implicit.
- It is the knowledge of how to perform a task.



And The events where as procedural memory basically denotes how of the procedure and therefore, procedural memory is usually implicit in nature you must have seen many, many events in our life. Where you perform that task and you remember the full mechanism how as to how to operate it say for example, cycling riding a bike running a computer whole of this mechanism you would realize that there are steps series of steps you know and all this steps have has to be religiously followed in sequence. If you want the mechanism to work appropriately, but then it is now, so nicely know acquired by you that this intermediate this steps transition between the steps none of this things you remember you realize as if things are getting done automatically this is called procedural memory.

(Refer Slide Time: 02:35)



Let us look at this very video to see how a medical technician actually performs a task meticulously although he knows what the apparatus is he knows what the concerned doctor has asked this technician to perform rest all involves whole degree of moment of knobs fixing the machine taking the output of the machine have a look at this [FL].

Now, let we have understood explicit and the implicit side of the memory, let us look at another aspect of long term memory what is called as prospective memory prospective something which is about to come. So, if a person fails to remember what he or she was going to do.

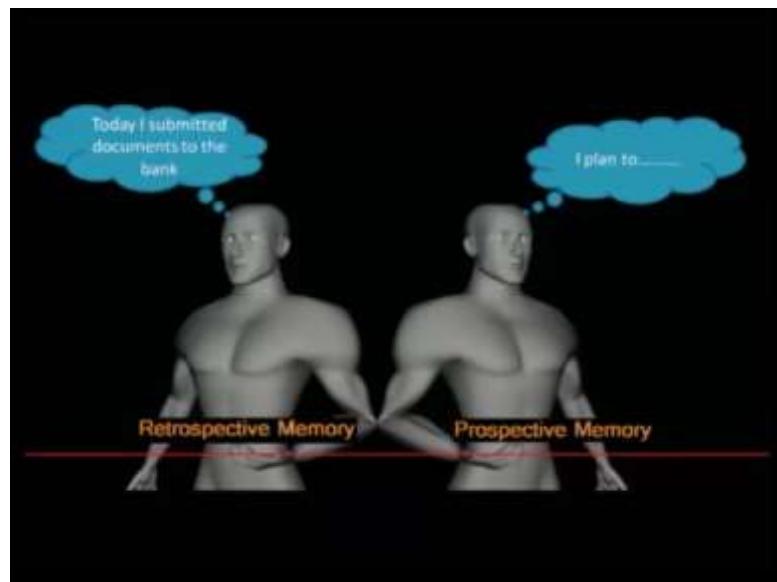
(Refer Slide Time: 04:07)

The slide has a dark red header bar with the title "Long-Term Memory: Prospective" in white. Below the header is a light blue background area containing three bullet points:

- It is the failure to remember what the person concerned was going to do.
- Inability to remember the intended action.
- Older people show problems of Prospective Memory.

So, say for instance I intend to go and switch on the light, leave my table go towards the switch board and half way if I forget what thought that is loss of prospective memory. So, the inability to remember the intended action is what is called as prospective memory older people usually they show this problem of prospective memory in our young days adulthood. Usually we do not have this type of problem unless we are too busy and we are into multi tasking then, it might happen because of competition between two thoughts which are going parallelly else even in the case of at least older people even if they have one single thought one single prospective is steeped at the head plan to execute there might be a problem in terms of inability to recollect what he or she was intending to go and do.

(Refer Slide Time: 05:18)



So, this very image represents what actually retrospective and prospective side of memory would be now retrospective memory. If you think today I submitted documents to the bank you have already performed that task and you remember prospective memory would be I plan to and you have planned something what exactly you have planned half way while trying to execute it, you forget that is loss of prospective memory it is mostly seen in elderly people having. Now understood sensory short term and long term memory let us once try to compare between this three systems of memory we will try to you know compare this three structures of memory on certain criteria's.

(Refer Slide Time: 06:10).

Comparing Memory Systems		
Approximate duration		
Sensory	STM	LTM
Iconic: 1-2 sec.	20-30 seconds	Days, months, years or life time
Echoic: 4-5 sec.		

So, on this screen when you see on the white font the word written there is the criteria on which to three memory systems are being compared.

So, first let us compare the memory system in terms of their approximate duration sensory memory. We discussed the duration for 1 to 2 seconds for iconic memory and 4 to 5 seconds for echoic memory this expands substantially. It goes from 20 to 30 seconds in the case of short term memory and in terms of long term memory it could be days months it could be even life time something starts from 1 second upto life time this is the whole expansion up to the first 5 seconds part of sensory memory upto 30 seconds that is short term and thereafter it is long term.

In terms of capacity we realize that sensory memory also has a relatively large capacity in terms of storing information and at least 16 items can be stored at the level of sensory memory.

(Refer Slide Time: 07:11)

Capacity		
Sensory	STM	LTM
Relatively large. At least 16 items much more	Relatively small. About 7 items	Very large. Limit unknown

And probably little more can also be done short term memory from that point of view given the time it has we realized that the capacity is relatively small, but this capacity increases many fold, if the items are divided into chunks depending on whether you form a chunk of three or chunk form of chunk of four items approximately up to 40 items can be stored in the short term memory.

Long term memory it is very large and the limit is just not known any and every thing can be stored then we come to transferring memory.

(Refer Slide Time: 08:04)

Transference		
Sensory	STM	LTM
Attention & recognition. Items attended to & recognized move to STM.	Rehearsal: Items appropriately rehearsed move to LTM.	NA

In terms of transfer we have the long term memory where transfer is not at all needed because information is already stored there it has nothing to do beyond that, but in case of sensory memory attention and recognition. They play an important role items that are attended to and items that are recognized they have the likelihood of moving towards the short term storage items that we do not pay attention to items that you fail to recognize they will not be forwarded to short term storage.

In case of short term we did discuss this factor also that there are two types of rehearsal the maintenance rehearsal and elaborative rehearsal now depending on the rehearsal the items are appropriately forwarded to long term memory.

(Refer Slide Time: 09:01)

Comparing Memory Systems		
Type of information stored		
Sensory	STM	LTM
Copy of input.	Sounds, visual images, words & sentences.	Primarily meaningful sentences, life events & concepts, some images, semantic & episodic memory.

Now, we come to the type of information that is stored in case of sensory memory, it is exact copy of input that we stored in the case of short term it can have sounds visual images words and sentences long term memory has the fantastic thing, long term memory primarily has the meaningful sentences life events concepts images .right Now we discussed semantic and episodic memory. So, whole of this becomes the part of long term memory in terms of inability to recall information from long term if you consider reason for information loss in sensory memory decay of trace as considered as the important reason why information is lost.

(Refer Slide Time: 09:53)

Comparing Memory Systems		
Reason for information loss		
Sensory	STM	LTM
Decay of trace.	Displacement of old information by incoming information.	Faulty organization, inappropriate retrieval strategy, interference.

In short term memory, it is the displacement of the old information by the incoming information, but in the case of long term memory it could be faulty organization it could be inappropriate retrieval strategy or it could be interference. So, two information, if they compete against each other to be recollected ,this could lead to interference you have given the file name memory and you search by file name emotion you will not get the information. So, inappropriate retrieval strategy is used or if because you know that the information is stored in an organized order you go for a random search, you are not able to retrieval the information this would be the possible reasons of loss of information from long term storage.

(Refer Slide Time: 10:51)

Reconstructive Memory

Bartlett's Study

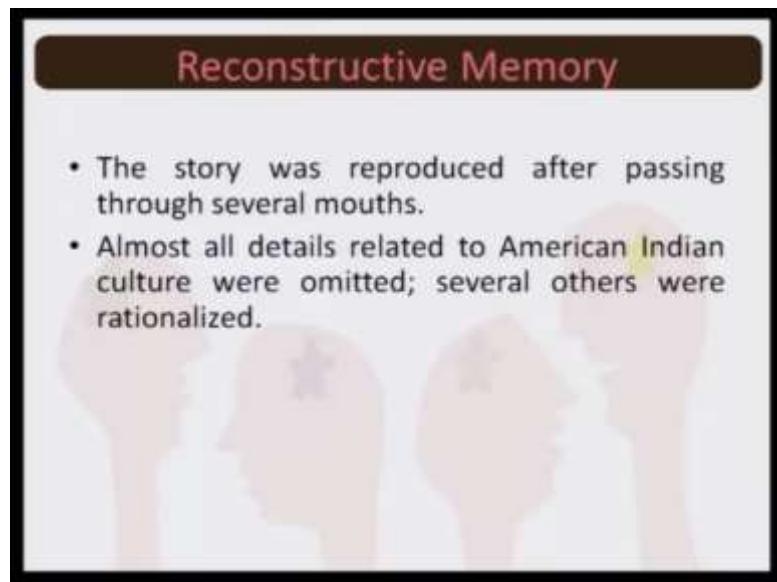
- Sir Frederic Charles Bartlett came forward with several short fables. 'The War of the Ghosts' is the most popular example talked about in psychology.
- A group of students were asked to read this story about North American Indians.

There are two more interesting things about memory we will talk about one right now the reconstructive aspect of the memory, Sir Frederic Charles Bartlett performed a very interesting experiment. What he did was that story was narrated to a group of students titled the war of ghosts and then the story was supposed to be reproduced by this students who had actually heard it what Bartlett able to prove was that the story. When it was reproduced to passing through several mouths underwent series of reconstruction.

(Refer Slide Time: 11:20)

Reconstructive Memory

- The story was reproduced after passing through several mouths.
- Almost all details related to American Indian culture were omitted; several others were rationalized.

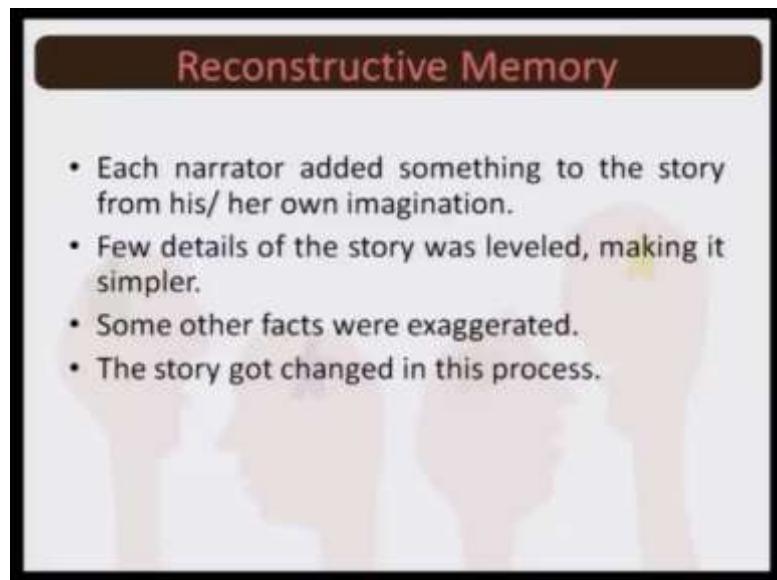


Almost all details related to the American Indian culture were omitted; and several others were rationalized. When students try to recollect the story reconstruct the story, what was very also interesting was that each narrator added something to the story based on his or her own imagination.

(Refer Slide Time: 11:40)

Reconstructive Memory

- Each narrator added something to the story from his/ her own imagination.
- Few details of the story was leveled, making it simpler.
- Some other facts were exaggerated.
- The story got changed in this process.



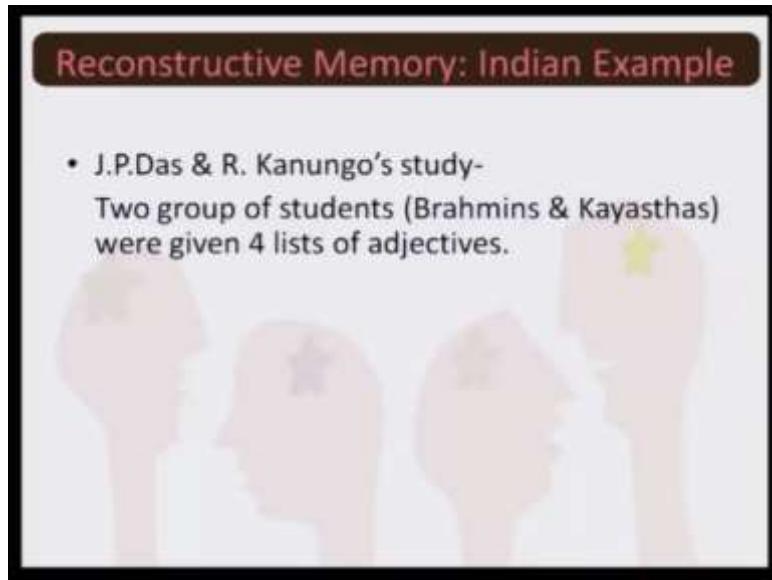
Few details of the story was leveled making it very, very simpler some other facts were exaggerated and therefore, what happen finally, the story got changed in the entire process Bartlett said that this is reconstructive memory. Why because something you

have heard of when it is transmitted from mouth to mouth the whole episode gets reconstructed several things are leveled several things are exaggerated several things are downplayed and therefore, the original content and the later content undergoes a big difference.

(Refer Slide Time: 12:35)

Reconstructive Memory: Indian Example

- J.P.Das & R. Kanungo's study-
Two group of students (Brahmins & Kayasthas) were given 4 lists of adjectives.



One very interesting example, I would like to quote from one of the Indian studies by J.P. Das and Rabindra Kanungo they conducted a very interesting study where two groups of students who belongs to two dominant casts in the country. Brahmins and Kayasthas they were given 4 lists of adjectives the first list had adjectives describing Brahmins in favorable terms like nice good looking clean and so on.

(Refer Slide Time: 12:57)

Reconstructive Memory: Indian Example

- List 1- Adjectives describing Brahmins in favourable terms.
(nice, good looking, clean, etc.)
- List 2- Adjectives describing Brahmins in unfavourable terms.
(rude, greedy, fat, etc.)
- List 3- Adjectives describing Kayasthas in favourable terms.
- List 4- Adjectives describing Kayasthas in unfavourable terms.

The second list had adjectives describing Brahmins in unfavorable terms. Like rude greedy fat and so on. And the same thing was done for Kayasthas list three had adjectives describing Kayasthas in the favorable terms list four describing in unfavorable terms. Now when this Brahmins and Kayasthas students are supposed to recollect the content every one remember more unfavorable adjectives than, the favorable ones and based on this J.P. Das and Rabindra Kanungo they inferred that people preferred to remember the bad attributes rather than, good ones one interesting thing which is also talked about in introductory psychology is an effect called Zeigarnik effect.

(Refer Slide Time: 13:53)

Zeigarnik Effect

- Bluma Zeigarnik, a Russian psychologist, compared memory for tasks that were successfully completed & those which were not.
- In fact she interrupted the work & did not allow them to finish it.
- Interrupted tasks were remembered more frequently than those which were completed.

Bluma Zeigarnik, was a Russian psychologist, who actually compared memory of tasks which you are able to complete and compared it with the task which you are not able to what she did was she basically interrupted the work and did not allow the participants to finish the task.

What she finally, found out and what is now called Zeigarnik effect is that interrupted task where remembered more frequently than, those which you are able to complete things that you are not able to complete, you would remember it more.

(Refer Slide Time: 14:51)

Zeigarnik Effect: Indian Example

- Dutta & Kanungo gave a new interpretation to Zeigarnik effect.
- The intensity of emotion aroused by the completed or the interrupted task is the critical factor.
- Any activity that gives rise to strong emotion, be it pleasant or unpleasant, is remembered better than ordinary everyday action.

Now, this might mismatch with her daily life experiences another interesting study again by Rabindra Kanungo along with Dutta they give a interpretation to the Zeigarnic effect they said that the intensity of the emotion that is induced by the complete or the interrupted task that becomes a critical factor. So, it is not the task per say, but the emotion that it leads to. So, any activity that gives rise to a strong emotion whether it is pleasant or unpleasant that does not matter the fact that the activity gives raise to strong emotion such events will have better memory.

you remember right now we said in are previous lecture the things which as an element of surprise things which as personal significance and things which induces great degree of emotional arousal in you, those things have better chances of getting recollected. So, this was the explanation given by Dutta and Kanungo. Why Zeigarnic effect works another interesting thing that is also talked about in memory is memory construction.

(Refer Slide Time: 15:57)

Memory Construction

- Recall of events that did not take place
- Memory implantation
- These are not necessarily deliberate
- Suggestibility

Bartlett he proved that there is a reconstruction in memory construction of a memory has basically to do with the experiences that was gathered in the clinical set up where memory is implanted and therefore, the participants recall events of their life which had actually not happened.

Now, this depends on the suggestibility of the participant certain type of content is implanted into your memory and you are supposed to recollect it. So, when you recollect know your life experiences you try to recollect when those events which are actually you did not experienced, but you are told that this is how things are happened with you this is called memory construction this type of memory modification.

(Refer Slide Time: 16:53)

The slide has a dark red header bar with the title "Memory Implantation" in white. The main content area is white with a faint background watermark of a person's face. A black border surrounds the entire slide.

- This is a type of memory modification because of misinformation.
- After experiencing an event, when individuals are exposed to new misleading information the recollection of the actual even gets distorted.
- Suggestive interrogation

Basically takes place because of the misinformation and after experiencing an event when individuals are exposed to new misleading information the recollection of the actual event it gets distorted and this is something that sometimes is also witnessed in interrogation what is called suggestive interrogation. So, if an officer interrogates the suspect and you deliberately you know ask questions which have lead answers.

For example if I ask you were you present there in that very building at that time that is a question which asks you to declare whether you were present or not and you have a option of saying that was not present in that building think of the other situation when I say. So, you are in building what actually happened at that time you are not given the opportunity to declare I was not available in the building the question is based on the premise that you are actually present in the building and then, it goes beyond asking you what actually did you see inside the building this an example of suggestive interrogation therefore, this is a misinformation the fact that you are not present in the building is not taken to account, but then a misrepresentation allows the whole construction of new sequence of events therefore, it is called as constructive memory.

(Refer Slide Time: 18:40)

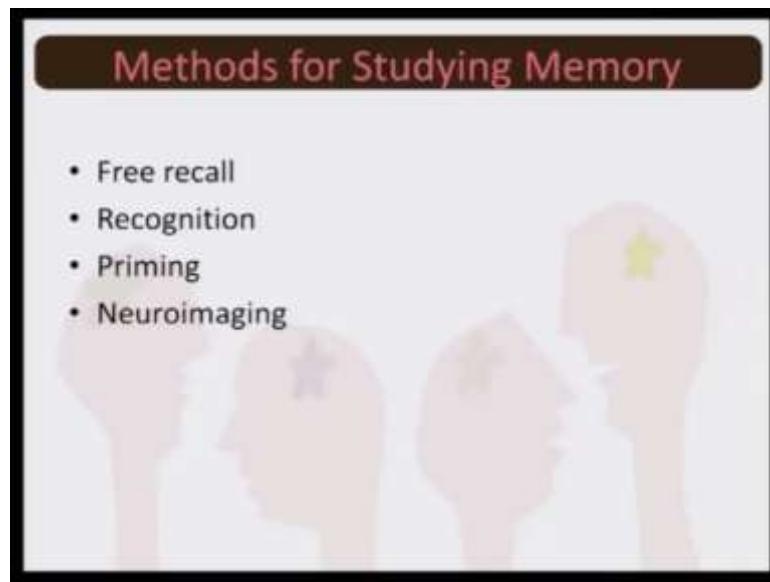
The slide has a dark red header bar with the title "Memory Distortion" in white. Below the title is a list of bullet points in black text. The background of the slide features a faint, stylized illustration of a person's head and brain.

- The change in the content of recall (memory) as a result of internal or external factors.
- Cognitive biases
- Suggestive questioning
- Schemas
- Motivation

Now, we come to what is called as memory distortion remember we are still not talking about forget forgetting will be our last lecture with respect to this very topic on memory now memory distortion basically in a change in content of the recall as a result of internal or external factors. So, there could be cognitive bias you have bias which does not allow you to remember good things about somebody about whom you have negative feeling. So, for example, if you do not appreciate someone all good things told about that very individual because of your bias you are not able to remember.

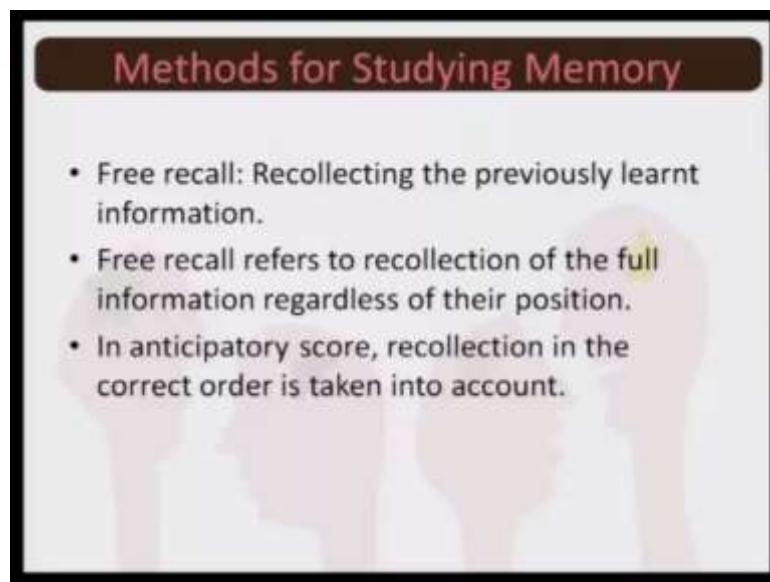
Say for example, right now we took the example of suggestive interrogation if you go for suggestive questioning the question that I ask suggests gives a cue to you as if what is expected out of you, what type of response should you give this is suggestive questioning this is bound to distort the memory plus this schema, you know how the representation of the world it you have made in your mind the mental representation that might be important in terms of better recollection accurate recollection or distortion and how motivated you are to recollect information that would also play an important role.

(Refer Slide Time: 20:20)



So, let us know talk about the methods that are predominately used for studying the process of memory four important methods. We talk about today free recall recognition Priming and Neuro imaging the recent phenomenon you find is the dominant uses of Neuro imaging technique, wherein the brain scans are used to identify which regions of the brains are involved in the memory of what kind of information.

(Refer Slide Time: 21:46)



Let us first begin with free recall free recall as you can make out from the word itself, it is recall that is recollection of the learnt information in a free order this means that you

are free to recall the information regardless of the position of the event .you remember We talked about serial position effect you know primacy in the effect. So, free recall basically means that you are supposed to recall the information regardless of it is position we have talked about know serial position effect the primacy and recency effect.

Now if I give you a list of items and then tell you that you have to recollect information in the order in which it was presented to you. So, say for example, if I give you a list of items that you have to procure from the market and said this 15 items have to be recollected in it's serial order. So, first item should be recalled first second item for at the second order third at the third-order you would realize that usually people commit much of an error in terms of recollection and that is what is called as you know recall where we have serial position effect where we have the primacy and the recency effect.

But free recall usually is considered as one of the good methods because you do not want to worry of about the relative positioning of the information rather you have to simply recollect the information. Now in anticipatory score recollection in the correct order is taken to account, but free recall would basically mean that you regardless of the position you just recollect the information and accordingly you know you get a score for that. So, that is one of the dominant methods in studying memory the second important method for studying memory is recognition and that is one of the most generously used techniques.

(Refer Slide Time: 22:44)

Methods for Studying Memory

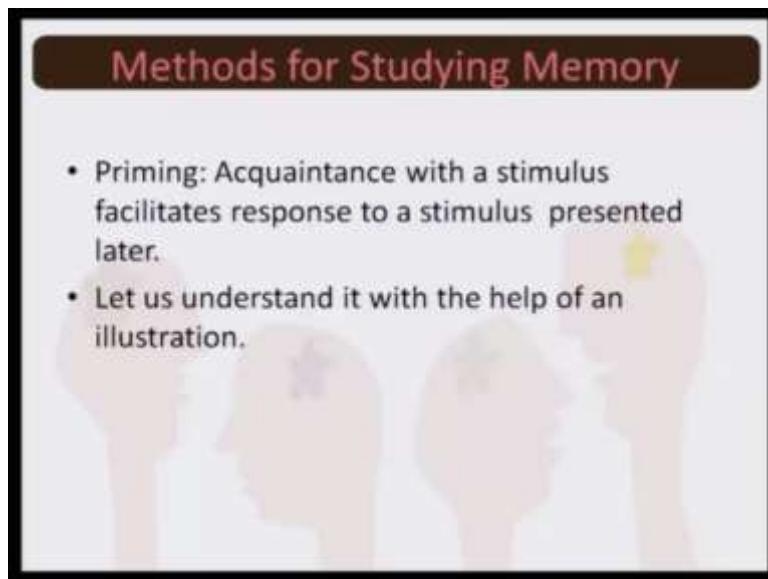
- Recognition: Recognizing learnt information amongst other material.
- Multiple-choice items

Now a day, even for this course we will come to evaluation we will come across multiple choice items. So, when you are supposed to recognize the learnt information which is hidden among other items. So, you have the question written in the top and you have four options only one answer is correct and the rest of the three are false information. So, when the actual information is hidden amongst the other information and you have to recognize this is the correct answer this is what had learnt this is called as the method of recognition multiple choice items is a best example of it.

(Refer Slide Time: 23:34)

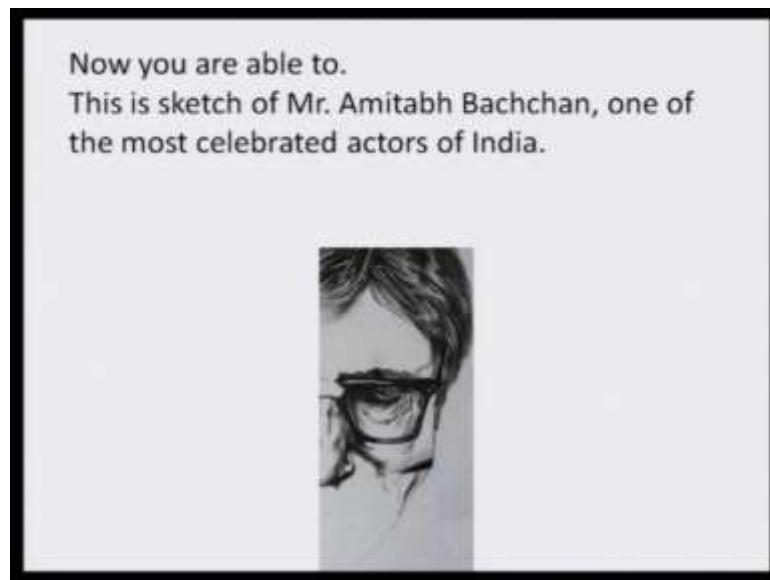
Methods for Studying Memory

- Priming: Acquaintance with a stimulus facilitates response to a stimulus presented later.
- Let us understand it with the help of an illustration.

An illustration showing two people from behind, looking towards a computer monitor. The monitor displays a presentation slide with the title 'Methods for Studying Memory' and two bullet points about priming. The background is a light blue gradient.

The third and interesting method of studying memory is priming. Now in case of Priming how acquaint you are with stimulus that is important. So, what happens? Acquaintance with a stimulus basically facilities your response to this stimulus which is presented later now let us understand with the help this illustration.

(Refer Slide Time: 23:48)



Now, I ask you that look at your screen and the based on the sketch you see at the bottom of the screen identify the person and am sure none of you would able to identify the person. add a little bit to it and say can you now identify the person given that you have little more clues perhaps some of you might make a guess,I add little more and, say now that very recently you saw one of his recent movies in which he had this very character con you know identify who you are looking at now when you see half of the face. So, you know him, he is most celebrated actors of Indian cinema Amitabh Bachchan this is Priming technique.

So, what actually happens here you are acquainted with the character you were presented with part of the information and depending on how well acquainted you are with facial features you would have identified first case you certainly not succeeded many of would succeeded just after the second slide. When this know little more clues were given some of you would by this time many of you would probably identified and after this much approximately all of you identified who is person is this is called the Priming technique.

(Refer Slide Time: 25:32)

The slide has a dark red header bar with the title "Methods for Studying Memory" in white. Below the header is a large, semi-transparent image of a human brain in profile, facing right. A small yellow star-like icon is positioned near the top of the brain's cerebral cortex. To the left of the brain, there is a bulleted list of text:

- Priming is most effective when used in the same modality.
 - visual priming with visual cues
 - verbal priming with verbal cues

Now, Priming is considered to be most effective when it is used in the same modality. So, if you are using visual Priming then, it is good to visual clues and when you are using verbal Priming then it is good to use verbal clues in that case Priming will be very, very effective because you are using same modality.

Key words - procedural memory, memory systems, reconstructive, zeigarnik effect, construction, distortion, priming

Introduction to Psychology
Prof. Braj Bhushan
Department of Humanities and Social Sciences
Indian Institute of Technology, Kanpur

Lecture - 22
Memory Forgetting

Now that we are on the last topic, today our focus would be not in terms of how much we succeed recollecting from our memory storage rather we would focus upon the failure in the attempt to retrieve information from the memory that is our focus would primarily be today on Forgetting. We will try to make out why people forget, how much they forget, and issues like this.

But before we come to what and why and how much, let us understand one thing and accept one thing that forgetting is one of the most useful attributes that you can visualize for human memory system. One way of looking at it could of course be that basically the message that has been transferred to the long term memory for certain reasons you have not been able to recollect it which results into forgetting.

(Refer Slide Time: 01:19)

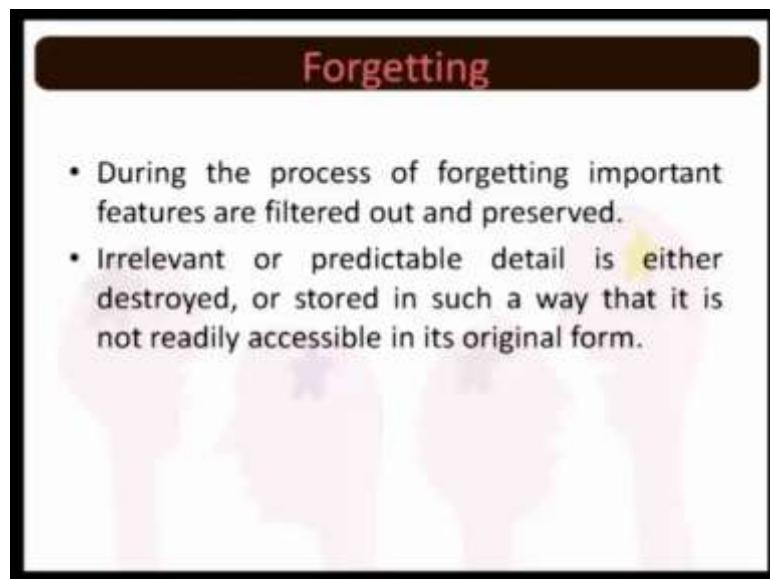
Forgetting

- Forgetting is a very useful attribute of the human memory system.
- Forgetting happens when messages have not been transferred to the long-term memory.
- “Time heals all wounds”
- Obvious benefit- Emotional pain and grief are softened.
- Forgetting also represents distortion of recollection of the past.

But there are obvious benefits attached to it. The most important thing that the emotional pain and grief, they get softened after a passage of time. You must have heard the proverb time that time heals all wounds. So what time does to the wounds? It basically helps you forget what you call the emotional balancing, the magnitude of the grief

gradually gets softened enough. Also forgetting might also represent the distortion of recollection of the past. The truth was something else and you narrate something else, which is completely devoid of the reality. But accepting all these things we must understand the value of forgetting.

(Refer Slide Time: 02:11)



Now, during the process of forgetting, important features are either filtered out or there could be a possibility that they are preserved. Right now we will also refer to one fact that many a times you forget involuntarily and many a times, you forget because you want to forget that thing. Now things which are irrelevant to us or details which are predictable they are either destroyed or they are stored in such a way that it is not readily accessible in its original form. And therefore, when we try to retrieve the information we commit certain error. And this is what people consider that this is forgetting, you have not been successfully able to re-call what you are supposed to at this point in time. Therefore, it is called forgetting.

There are series of theories which explains why people forget. Let us talk about the dominant theory which tries to explain the process of forgetting. First and the most important theory is the Theory of Decay.

(Refer Slide Time: 03:20)

Theories of Forgetting

Theory of Decay

- Forgetting is a function of time.
- Repetition leads to strengthening of memory traces.
- The associative bond weakens with the passage of time.
- We forget unused information.

Now, basically what theory of decay says is that you remember we talked about the fact that there are concepts which are remembered as nodes of information and then there are networks in these nodes. Now when similar type of events are repeated, similar information is given to you time and again, with repetition the memory traces they become very strong. Now think of a situation where you learnt something you memorized it, but then you did not get a chance to repeat it. So what would happen then, the associative bond that is formed that becomes weaker enough and the weaker the bond becomes higher are the chances that you will forget the information.

So, in all cases where associative bonds are weakened with the passage of time and because forgetting functions as a one of the functions of time therefore we will usually forget those information after lapse of certain period of time. This is what is called as Theory of Decay. Time has passed you did not get a chance to repeat the information and therefore the bond that was formed the memory trace that was formed that trace becomes weak enough to be recollected. This is Theory of Decay.

The other interesting theory which explains forgetting is the interference theory. Now interference you can very easily make out. Two things which interferes which overlaps. Now interference could be of two types. You remember when we were talking about transfer of learning at that time also we said that there is a possibility that things which are learnt previously might interfere with the learning of the new task. This was one

possibility. And the other possibilities were the newly learnt thing, it does not allow you to perform things appropriately.

(Refer Slide Time: 05:25)

Forgetting

Interference Theory

- Retroactive: Newly learnt information prevents retrieval of previously stored ones.
- Proactive: Previously learnt information interferes with the newly learnt information.

Similar type of situation comes up in case of interference theory also. There are two types of interferences; it could be retroactive or it could be proactive. Now proactive interference would be a situation, where newly learnt information it prevents retrieval of the previously stored information. So, I have learnt something in the past, I have learnt something very recently, and the newly learnt information does not allow me to recollect what I had already memorized in the past. So, earlier the stack that is with me in my long term storage that I am not able to extract out, because of the interference that is created by the newly learnt information. This is called Retroactive Interference.

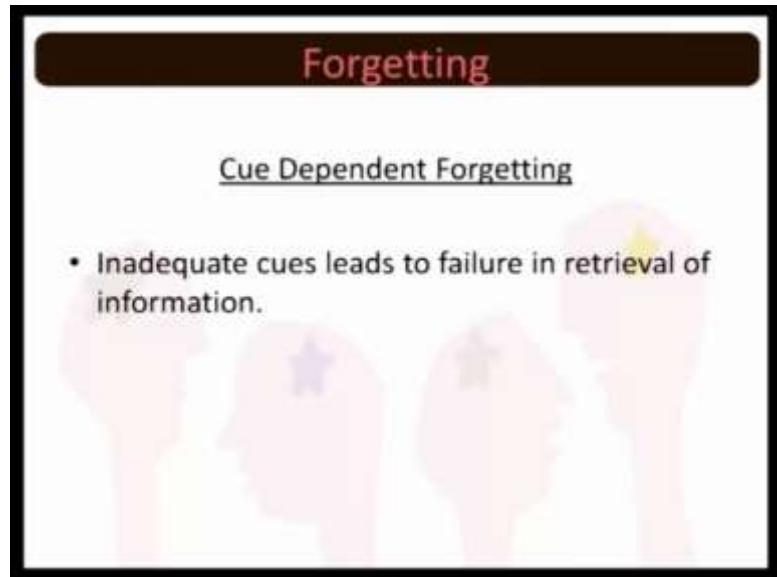
The reverse of it would be proactive interference. Proactive interference would mean that the previously learnt information that interferes with the newly learnt interference. I already have something in my stack; I have some already stored something in my long term memory, now I learn a new thing, I memorize it. When I try to recollect the newly learnt information I somehow extract the old information. So, what is happening actually, the previously memorized content that interferes with the process of recollection of the new information. This is called Proactive Interference.

Now interference theory says that either the interference is proactive or retroactive, but the fact remains whatever is that desired information that you want to extract out, that

information you are not able to because of this competition between the old and the new information. And therefore, you commit an error in terms of accuracy of recall of the content and therefore it is a kind of a sort of forgetting.

The third theory which also has to do with how we store information in long term, you remember we discussed that in long term one of the important strategies is to provide appropriate cue to the information, giving a good file name which will help you which will ease the process of search whenever you have do so in the future. Now if there is a problem with giving appropriate cue and therefore, if because of the inadequate cue you are not able to retrieve the information then this is called Cue Dependent Forgetting.

(Refer Slide Time: 08:04)



You basically did not provide the sufficient cue the adequate cue and because of this inadequacy you are not able to recollect the information. This is cue dependent forgetting. So, this is the third theory which tries to explain why we forget.

And fourth theory is basically talking about the overall failure of the storage system. Now this theory basically looks at the information processing approach.

(Refer Slide Time: 08:42)

Forgetting

Theory of Storage Failure

- Look at this viewpoint from the information processing approach (sensory → STM → LTM).
- When too much information pushed in, some of them are not retained.

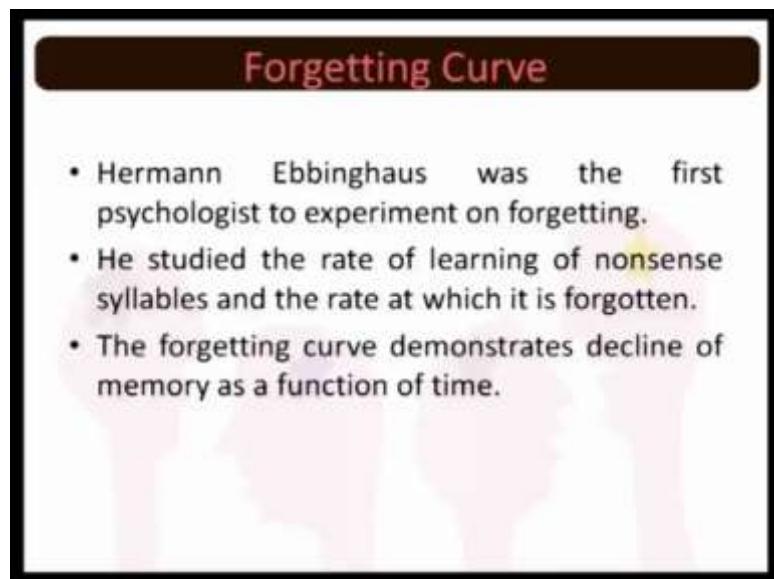
This is the view point, it says that from sensory to short term to long term this is how the memory moves. And it is long term where the information is stored. Now how much of information is pushed in, and how much of it can actually be retained, that is a matter. So, somewhere you can visualize this theory in little symbolic order. Say for instance you have attached a pen-drive or an external drive or SD card in a system and then you realize that it says that your external device, your pen drive or your SD drive has this capacity, say for instance it has one tb that is a size. Now that the external drive can store information only up to one tb. The moment you are about to reach that level it starts giving you a signal that, fine only these many bytes of information can be stored more because you have gone for an optimal usage of this external storage device. So, theory of a storage failure actually banks on this very hypothesis that the information that is supposed to be retained is dependent somehow on the overall capacity. Now remember one thing we discussed in long term storage, that the ultimate capacity of long term memory system is not known. All we know is that based on personal significance and based on the other relevant information most of the things are retained with us.

So, certain things that we know that it is extremely useful to us, we will always recollect it, we will always store it, and will never commit error in terms of recollecting it back, whereas certain types of information might not be significant after passage of certain period of time. Say for instance you memorized the poem because it was one of the expected questions in your examination. You know that this was just a poem which was

basically memorized only to serve you the purpose of successfully scoring in your examination and therefore the chances of further forgetting it is very high.

If you recollect now when you memorize questions from your notebook, you even remember where the teacher had put a red mark, where did you turn the page, the commas, the full stop, most of these feature you remember. And within a certain period of time, just within few days you start forgetting these traces and little later you do not even remember any of those things. Now all these theories can be used to explain it. Decay explains the process from one point of view, cue dependent forgetting explains it from a different point of view, storage system explains it from a different point of view, and the interference theory explains it is from a different point of view. But all these four theories basically explain why people forget.

(Refer Slide Time: 12:19)



Let us now come across one of the examples. Let us first understand that Hermann Ebbinghaus was the first psychologist who conducted experiments on forgetting. And he basically what he did was he again use the nonsense syllables tried to see how much people forget over a period of time. So, forgetting was actually experimentally verified in terms of decline of memory as a function of time.

(Refer Slide Time: 12:43)



Now, this is the curve what is called as forgetting curve and Ebbinghaus came forward with this very curve. Basically what he did was that on y axis he had retention and on x axis was the number of days. How much of information is stored or how much of information is lost? Remember he was using nonsense syllabus for his studies.

So, meaningfulness was already taken care of. All the items that were supposed to be memorized did not carry any meaning. Now of all these now meaning devoid information, how much of loss takes place actually and this is what Ebbinghaus was trying to study.

(Refer Slide Time: 13:28)

Forgetting Curve	
% of forgetting	After lapse of (time)
47%	20 minutes
53%	60 minutes
56%	9 hours
66%	1 day
72%	2 days
75%	7 days
79%	1 month

What he found was that after lapse of around 20 minutes there have loss of 47 percent of information. After 1 hour 53 percent loss of information, after 9 hours we have 56 percent of loss. After 1 day we have 66 percent, 2 days 72 percent, 7 days 75 percent and after 1 month we have loss of 79 percent of information. Now if you look at this curve you will realize very interesting phenomena; the loss in the first few minutes is very high and gradually it starts stabilizing.

So, from 1 hour, that is 60 minutes to 9 hours you just have an addition of 3 percent of loss, whereas in the first 20 minutes you have a massive down fall, 47 percent of information is lost. 20 to 60 minutes you have a 40 minutes gap, but then the information lost is very little, just 6 percent more, 3 percent in 9 hours and 10 percent when you cover one full day 24 hours. So, that way you realize that there is not much of a loss. And again the loss of information at the end of the second day is 72 percent, whereas loss of information on the 7th days 75 percent only.

So, in 5 days you lose only 3 percent of information. This basically gives us a feel that actually what happens in the case of human being is that in the initial phase we have a drastic loss of information and this loss gradually starts getting stabilized. And by that time we complete 7 days, 1 week period, we realize that the information is by and large stable now. Little bit of loss is there, but it is still stable in nature.

So with this we come to an end to whatever we had to talk with respect to forgetting. But because we are talking about Ebbinghaus, so let us understand one thing, Ebbinghaus also gave a formula to understand how much we save in the process of retention. Therefore, it is called a method of Relearning or Saving Method.

(Refer Slide Time: 15:55)

Saving/ Relearning Method

- Ebbinghaus used saving method as a measure of retention.

$$\frac{\text{Time taken in original learning} - \text{Time taken in new learning}}{\text{Time taken in original learning}} \times 100$$

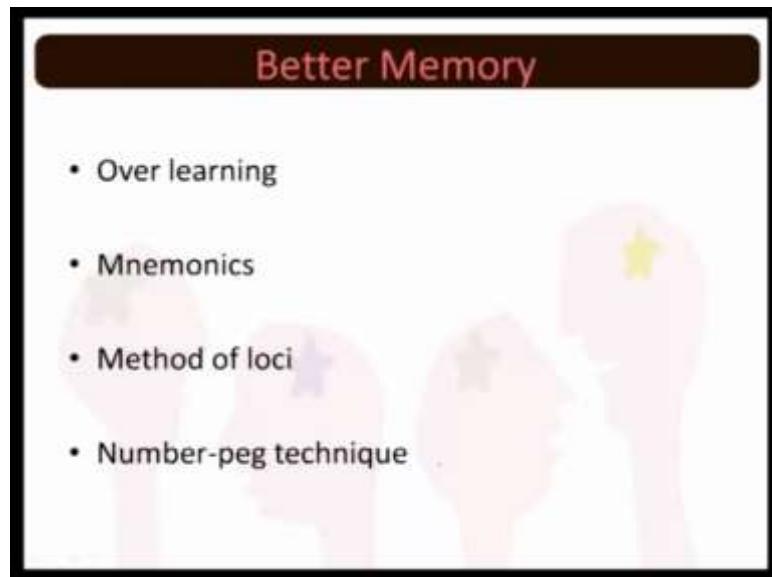
So, what he said was that the time that you take in original learning minus the time taken in the new learning. You have learnt the information, memorized it, now it is lost you are again trying to memorize it. So, time taken originally and time taken in the next attempt divided by the time taken in the original learning and you multiply it by 100 and he said this is what is called as Ebbinghaus Saving Method. Because it is realized that you save lot of time; you remember even in leaning when we were talking about extension and when we referred to spontaneous recovery, there also we had discussed that once the extension takes place the process of spontaneous recovery is very fast even if the animal took say a series of trials to learn the information originally.

Subsequent learning takes very few attempts so is the case with the memory. And therefore the time taken in the next phase is different from the time taken originally to memorize the information, and this is what is Ebbinghaus contribution to the process of forgetting.

So, what have we discussed till now, we have tried to understand the process of memory, we have try to succinctly now understand the process of forgetting. Now realizing the

importance of memory and also of course accepting the beauty of forgetting, all of us would always visualize of situation where the overall capacity of the individual to memorize things should multiply should increase. So, what are the tips for better memory? Let us discuss it very succinctly.

(Refer Slide Time: 17:46)



Four options can be thought of, either you over learn or you use three other techniques; the method of mnemonics, the method of locus, and the number-peg technique. So, very succinctly in next couple of minutes, we will discuss methods which can enhance your memory and you can try it out.

Now, the process of over learning, basically means that you keep on keep on repeating it to an extent that the whole process becomes automated. So, it is nothing but doing it several times, several times. So you over learned the thing, because you repeat it several times therefore automatically the information becomes much more automated, the whole process of recollection is automated. This is the method of over learning. But remember over learning is too tedious and approach, let us think of the other intelligent options.

(Refer Slide Time: 18:54)

Better Memory: Mnemonics

- **Mnemonics:** Mnemonic devises aids memory by associating easy-to-remember constructs and the task at hand.
- Rhymes & jingles are good examples of mnemonics.
- Although they are mostly verbal, they can be visual or auditory in nature.

Mnemonics is another interesting method. Mnemonics devices they basically aid our memory by associating easy to remember constructs and the task at hand. The best examples of mnemonics are rhymes and jingles. I cannot give you very good example other than repetition of a rhyme, but I can share one interesting experience with you. During my student days I had a friend in philosophy and he would memorize the entire book just by attaching it, and what you call putting and fitting the theories hardcore philosophical view points and theories into nursery rhymes.

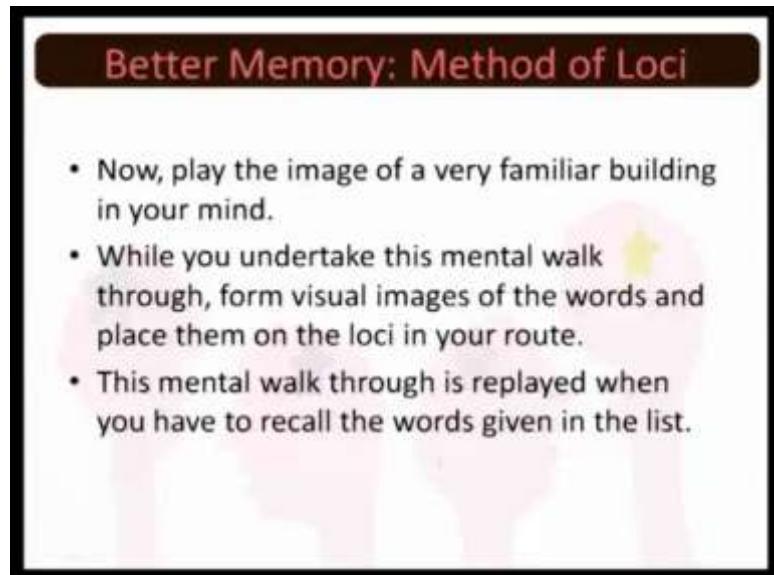
So, if you remember jingle bear jingle bear jingle all the well, all you do is that big big theories would be now put into such rhymes and he would just recollect the rhyme because he already had memorized it. And now big theories can be retrieved using those cues. Although, rhymes and jingles are mostly verbal, you can think of visual and auditory formats of rhymes and jingles. We saw this very example. Now at that time we were looking at this very example with respect to how the mother recollects the episode of how her child used to sing this very song. But now let us replay the same video and see how the child learns the rhymes.

Look at the clip to see an actual attempt by a child to memorize a poem. Now two methods we have discussed, now either you over learn or you have already memorized some rhymes and jingles. So, you convert the new information into rhymes and jingles you embed it over the existing rhymes and jingles and you will have a better memory.

The third format that can again enhance your capacity to store information is method of locus. Now what happens here is that you have already a memorized space, say for instance, your college building, your school building, your office, so you have a walk through you know where to enter, how to move, how does the corridor move ahead, what leads to where and so for. And now once you have the memory of the space, all you have to do is that you associate it to the new information that you are supposed to memorize.

Say for example, if you have a list of words with you, that you have to memorize all you have to do is that you associate it with the space that you have already memorized. Now the prominent places in the building; the gate, the corridor, the first door, the brown door, the green door likewise.

(Refer Slide Time: 23:25)

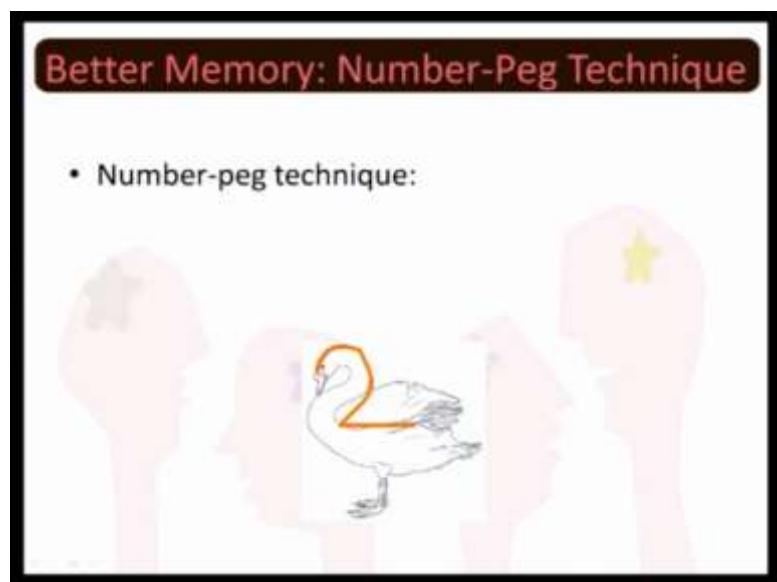


So all you do is that you now undertake a mental walk through and when you take the mental walk through you form the visual image of the world and all you have to do is that in that very mental walk through you keep on locating these words, their visual images, so that next time when you have to recollect all you have to do is it we have to just walk through that very space. And in this process of mental walk through the second time, the moment you see the main gate, you remember what was the word; green gate, brown gate, the left turn, the right turn whatever significant land marks that you have identified, all those significant land marks on a mental walk through is now associated with the visual image of the walk and that would help you a lot. In fact, the person who

holds the Guinness book of records for the best memory ability. If you see him performing in the experiment all he does is that he uses this very technique.

And the last method that can be used to increase memory is what is called as Number-Peg Technique. Now number-peg technique is a very interesting technique. You have information given to you and this whole piece of information all you have to do is that you have to convert it into number. Those numbers are then further linked in the form of a story and then you memorize the story you remember the whole information.

(Refer Slide Time: 24:58)



Look at your screen you see a swan and then you can now make out that there is an actual mental image that you already carry and that mental image now you have convert into two. So likewise, all forms that you have already with you in your memory system, you can convert them into numbers. And more rhyming you make it the better you would succeed. Now let us take an example I will ask you to memorize a number.

(Refer Slide Time: 25:33)

Better Memory: Number-Peg Technique

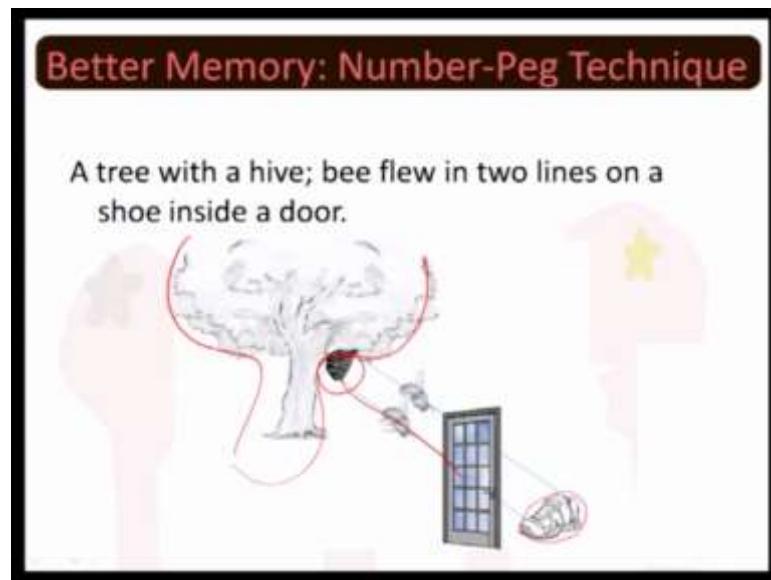
- Suppose you have to memorize the number
- 359924.....
- You convert these numbers into pegs and make a story

3= tree
5= hive
9= line
2= shoe
4= door

And the number is 359924; This is a number that you have to memorize. And this might now continue you remember we had done this exercise when we were going through chunking, where we said that you break the information in the chunks of 3 or in the chunks of 4 and this is how you enhance the capability of your short term storage. Right now we are talking about number-peg technique and imagine that this is the number that is given to you and you are told that you have to memorize it; 359924 and this might continue.

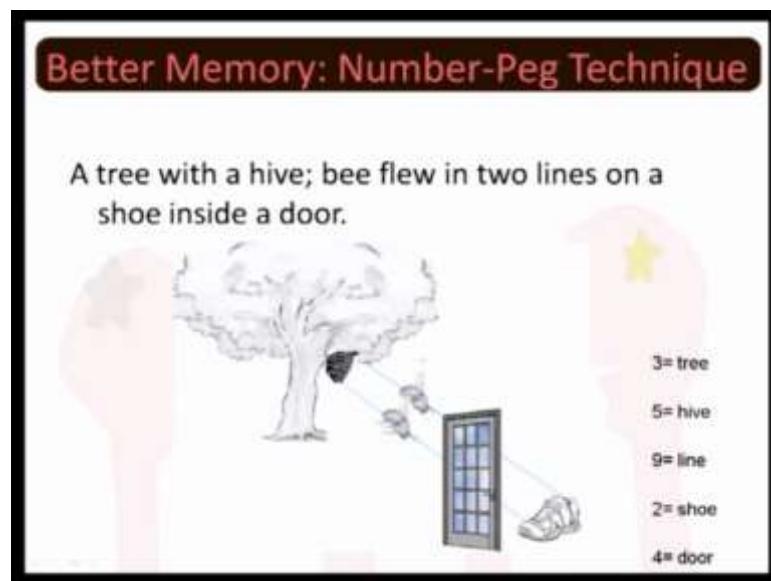
Now, convert these numbers into pegs and then construct a story. So, 3, the rhyming word would be tree, 5 the rhyming word would be hive, 9 line, 2 shoe, 4 door. So, these are basically the rhyming words and what you do now is that you simply now convert this numbers into pegs and then you make a story.

(Refer Slide Time: 26:32)



Now, you look at this image 3 tree. So, all you do is that you have now made a tree here. So, this is 3, 5 is a hive, 9 is line, 2 is shoe and then 4 is door.

(Refer Slide Time: 27:00)



So, let us again now look at this story. The number that was given to us was this 359924. So, 3 was tree, so you have made a tree, 5 was, hive you have added a hive to the tree, because there was double 9 therefore you have drawn two lines. And all you are now visualizing it that from a tree, two bees from the hives they are entering through the door

and then going to the shoe. So, a tree with the hive bee flew in two lines on a shoe inside a door.

So, all you have to memorize, it is very easy to visualize a tree with a hive 2 bees following a straight line entering through a door and there entering into a shoe. This is called number-peg technique. A bigger chunk of information, what you do is these numbers are converted into pegs and these pegs are further attached together to convert into a story. This creates a mental image which in turn will help you recollect the number very fast. So, this is called Number-Peg Technique.

And with this we have come to an end to our discussion on the topic memory. Just to summarize, we talked about the three structures of memory; the sensory, short term, and long term memory. And in long term of course we devoted too much of time to understand different formats of long term storage. Semantic memory, we talked about episodic memory, there also we classified, that I witness and flashbulb could be to such important different distinct type of memories. And then we came to the procedural aspect of the life that we memorize saying that memory can be divided into procedural and declarative memory what is also called as explicit and implicit aspects of memory. And then we talked about forgetting.

And now we are finally concluding our discussion on memory trying to understand that there are possible techniques of enhancing the overall ability of an individual to store more and more information using intelligent techniques, such as method of locus or number-peg technique. When we meet next we will be talking about a new concept. And that new concept would be emotion.

So, we started with sensation, perception, learning, and memory. And now we would be coming to the one of the most significant attributes of human beings, that is human emotion. That will be our next series of lectures.

Key words - forgetting, theories of forgetting, forgetting curve, mnemonics, number-peg technique, method of loci

What is learning?

- Learning as a topic of study is very important both from the general or everyday sense as well as the psychological sense
- Learning is important for adaptation – we need to modify our behavior potential as a function of experience so that mistakes are not repeated
- Learning therefore is a fundamental process

What is learning?

- A *change* in Behavior
- *Experience* is an important factor
- The change is *Relatively Permanent or Stable*
- Involves modification of behavior as a result of experience

Unlearned Behavior

- Many behaviours are unlearned – Instincts and reflexes
- Instincts and reflexes help in adaptation but do not have to be learned

Distinguishing Learning

Distinguishing learning from other changes in Behavior

- Temporary behavior changes due to changes in bodily conditions (disease, impact of drugs)
- Permanent changes due to damage, accident etc. (such as brain damage, loss of limb or sense organ)

Distinguishing learning....

- Maturational changes (these are a part of normal biological development and not due to specific experiences)
- Biologically determined sequences or patterns of growth that are relatively independent of the environment
- Maturation + Learning --- interaction

Distinguishing learning....

- Two other phenomena also involve permanent change in behavior but are generally not classified as learning
- Habituation: Decrease in responsiveness to a particular stimulus as a result of repeated occurrence of that stimulus
Imprinting: A primitive form of behavior change. Rapid learning of a species specific behavior (response to a stimulus at a early critical age) – not all animals imprint

Learning vs. Performance

- How does one determine whether learning has occurred?
 - Relatively permanent change that are evident in performance
 - Sometimes learning occurs but is not observable
- Thus learning and performance are related but are still distinct

How has learning been studied?

We will look at some forms of learning broadly studied by psychologists before discussing the theories

- Forming associations between events – classical conditioning, operant conditioning
- Learning through observation
- Importance of cognition

How has learning been studied?

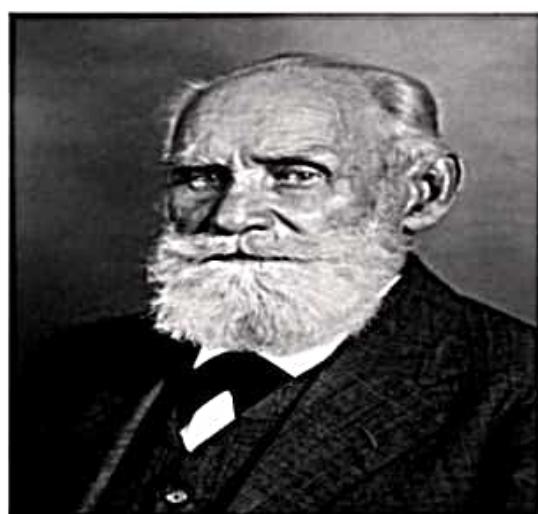
We will look at some forms of learning broadly studied by psychologists before discussing the theories

- Forming associations between events – classical conditioning, operant conditioning
- Learning through observation
- Importance of cognition

Theories of Learning

- Conditioning - Classical Conditioning ; Trial and error learning; Operant Conditioning
 - Cognitive Learning – Learning through Cognitive maps; Latent learning, Insight learning
 - Observational Learning
-

Classical Conditioning



Ivan Pavlov
Stimulus – Response
Associative Learning

Classical Conditioning

- The animals learned to associate the sound of the bell or tone to the food
- According to Pavlov this was a fundamental form of learning through association
- Classical conditioning – A neutral stimulus gets associated to a behaviour that does not produce that behaviour (Bell > Salivation)

Steps of Classical Conditioning

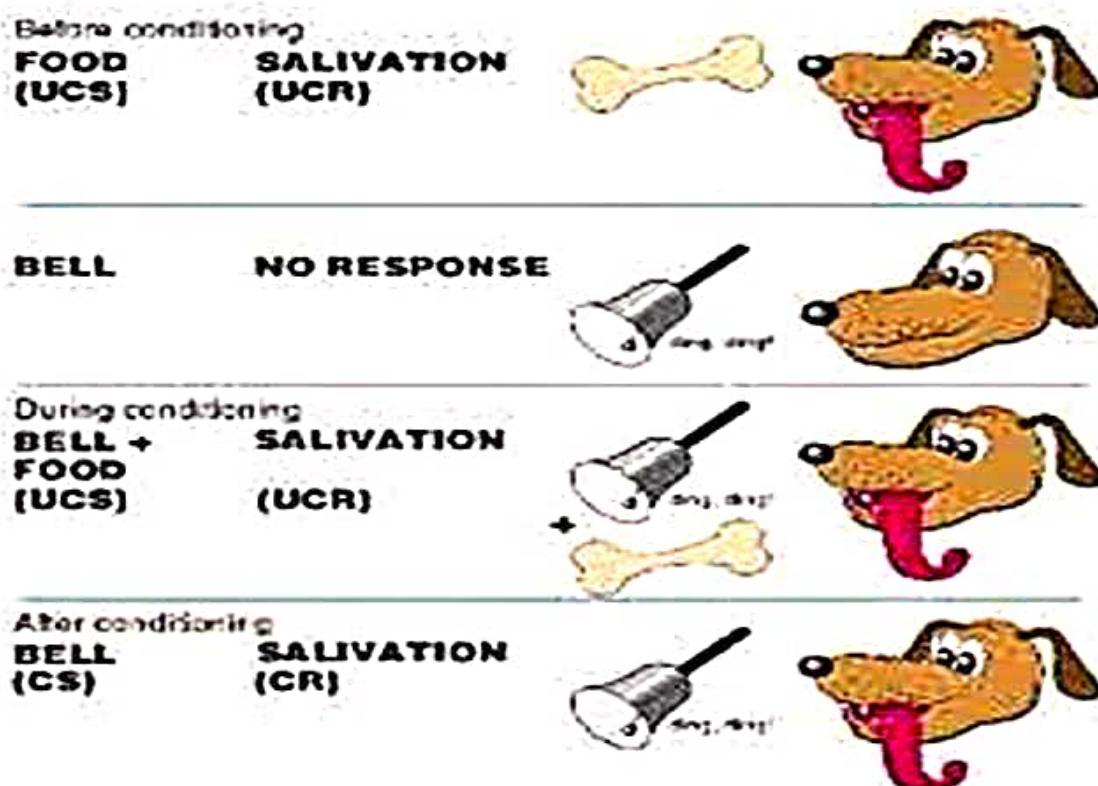
Food -----> Salivation
(UCS) (UCR)

Only Bell -----> No response/
no salivation

Bell + Food -----> Salivation
(UCS) (UCR)

Bell -----> Salivation
(CS) (CR)

Process of Classical conditioning



Classical Conditioning

Stimulus & Response Terms

- Associative learning (learning by association) – Neutral stimulus (bell) and natural stimulus (food)
- Specific terms related to stimulus and response
 - Unconditioned Stimulus (UCS)
 - Unconditioned Response (UCR)
 - Neutral Stimulus (NS)
 - Conditioned Stimulus (CS)
 - Conditioned Response (CR)

Stimulus and Response Terms

UCS – A stimulus that leads to a response naturally (sight of food)

UCR – A natural response to a particular stimulus (salivation)

NS – A stimulus that does not lead to a response naturally (bell or tone)

CS – A neutral stimulus, when paired with UCS leads to a response that is naturally produced by UCS

CR – A learnt response to the CS that was earlier Neutral

Examples from everyday life

Questions/ points to ponder

- What is learning?
- What kind of change in behaviour is learning?
- How to distinguish learning from other changes in behavior?
- Learning vs. performance
- What is classical conditioning?
- What are the steps of classical conditioning?
- What are the Stimulus & Response Terms in classical conditioning?

Thank You

Shikha Dixit

Professor of Psychology,

Department of Humanities & Social Sciences,

Indian Institute of Technology Kanpur,

Kanpur, 208016, U.P., India

Email: shikha@iitk.ac.in

Module 5: Learning

Lecture 2: Principles of Classical Conditioning

Classical Conditioning

- Classical conditioning is based on experiments by Pavlov
- Pavlov found that the conditioned stimulus that is bell leads to the occurrence of conditioned response that is salivation
- Why does it happen and how do we explain it?

Explanations of Classical Conditioning

There are two main explanations

- **Stimulus Substitution**

The response elicited by UCS, is elicited by CS after conditioning due to bonding or substitution of UCS by CS

- **Expectation**

A link is formed between the memory trace of CS and UCS and the CR is made in expectation of UCS. So, Salivation occurs in expectation for the food when the bell is sounded

Important Principles of Classical Conditioning

- Acquisition
- Extinction
- Spontaneous Recovery
- Stimulus Generalization
- Stimulus Discrimination

Acquisition

- Refers to the process of classical conditioning
- Conditioned stimulus finally acquires the potential of eliciting the conditioned response
- A CR is acquired because of contiguous pairings of CS and UCS
- Temporal contiguity is important in acquisition
- Most effective conditioning occurs when the time gap between the presentation of CS and UCS is very less

Extinction

- Once conditioning has occurred, then if CS is presented alone/without the UCS several times then gradually the CR diminishes
- If the unconditioned stimulus (food) is no longer paired with the conditioned stimulus (that is the sound of bell or tone), gradually the conditioned response of salivation would decrease and disappear

Spontaneous Recovery

- Conditioned response can appear after extinction also – this brings us the concept of Spontaneous recovery
- After extinction, the *conditioned response* which has undergone *extinction* reappears with the restoration or repeating of CS and UCS pairing

Stimulus Generalization

- A tendency to make conditioned response to stimuli that are similar to conditioned stimulus
- Stimuli similar to the conditioned stimulus may also lead to elicitation of the conditioned response
- Stimulus generalization can serve the function of adaptation

Stimulus Discrimination

- The process of learning to make a response to one stimulus and different/no response to another stimulus
- Stimulus discrimination is the tendency to respond differently to stimuli that are similar to a particular stimulus
- Salivation response of Pavlov's dogs to a specific kind of bell but not to a different kind of bell that was not associated to food is an example of discrimination

To Recapitulate

- Explanations of Classical Conditioning
- Acquisition
- Extinction
- Spontaneous Recovery
- Stimulus Generalization
- Stimulus Discrimination

Thank You

Shikha Dixit

Professor of Psychology,

Department of Humanities & Social Sciences,

Indian Institute of Technology Kanpur,

Kanpur, 208016, U.P., India

Email: shikha@iitk.ac.in

Module 5: Learning

Lecture 3: More About Classical Conditioning

Principles of Classical Conditioning

- Acquisition
- Extinction
- Spontaneous Recovery
- Stimulus Generalization
- Stimulus Discrimination

Second – order – conditioning

- Second order conditioning - When a neutral stimulus is paired with a conditioned stimulus it gets associated to the conditioned stimulus and produces the conditioned response
- The conditioned response is elicited without the first conditioned stimulus present

- First order – Conditioning occurs and a conditioned stimulus elicits a conditioned response
- Second order – Extending the conditioning to a higher level. Pairing of conditioned stimulus with a neutral stimulus. The second neutral stimulus elicits the conditioned response
- Example

Classical Conditioning and Human Learning: Conditioned Fear

The case of Little Albert

- Watson and Rayner (1920), conducted an experiment on 'Little Albert' who was a nine-month old child
- Watson's aim was to explore if fear response in children can be conditioned and that through the process of conditioning can a child be made to fear any neutral stimulus
- Little Albert was classically conditioned to experience fear at the sight of a white rat. His fear response got generalized to other white furry objects also

Stimulus and Response Terms

- Neutral Stimulus: White rat
- Unconditioned Stimulus: Loud noise
- Unconditioned Response: Crying and fearful emotional response
- Conditioned Stimulus: White rat
- Conditioned Response: Crying and fearful emotional response

- This experiment was important as it demonstrated the role of classical conditioning and associations in learning of fears
- Watson could not desensitize Albert to the fear producing stimulus
- Later researchers have shown that conditioned fears could be eliminated

Importance of classical conditioning in understanding fear response

- Understanding fear response and phobias or irrational fears
- Fear response may happen due to generalization (sometimes finding the source is difficult)
- Many emotional responses are conditioned
- Unlearning – behavior therapy

Taste Aversion and Biological Preparedness

- Is classical conditioning always determined by environmental contingency or stimulus experience?
- Researchers have postulated that in some cases classical conditioning or learning of associations has biological constraints
- Biological preparedness is important in understanding some associations and animals can learn them more easily

- Biological preparedness has been demonstrated by Garcia and Colleagues
- Rats learned to avoid the taste associated with feeling sick and nauseous. This happened even if the sickness appeared several hours after exposure to the taste
- This phenomenon is known as taste aversion

- Biological preparedness refers to the research observation that some animals are biologically pre-programmed to learn some associations
- Animals learn to avoid the taste/ smell of food that leads to sickness even after one exposure. This is important for survival
- Such preparedness is species specific and has been explained on the basis of evolutionary response and evolutionary history

To sum up...

- When food becomes associated with nausea, it becomes a conditioned stimulus that elicits conditioned response of taste aversion
- Garcia demonstrated that aversion can occur many hours after the consumption of food
- CS – UCS contiguity is not maintained (the assumption of temporal contiguity is not always true). Biological constraints influence conditioning
- Biological preparedness impacts aversion

To Recapitulate

Lecture 4

- Second order conditioning
- Conditioned fear response
- Biological preparedness and taste aversion

Next Lecture – Instrumental/operant
conditioning

Thank You

Shikha Dixit

Professor of Psychology,

Department of Humanities & Social Sciences,

Indian Institute of Technology Kanpur,

Kanpur, 208016, U.P., India

Email: shikha@iitk.ac.in

Module 5: Learning

Lecture 4: Operant Conditioning

Elicitation of Response

- Classical Conditioning: Elicitation of response
- Unconditioned response (UR) and conditioned response (CR) are both elicited by unconditioned stimulus
- Elicited responses - Reflexive and involuntary
- Example of elicited response is salivation or eye blink

Emission of Response

- Researchers such as Skinner have differentiated between elicitation and emission of responses
- Emitted responses are voluntary. Response such as pigeon pecking at a window of an apparatus to get a pellet of food is an example of an emitted response
- Response is emitted by the organism for the reinforcement or consequence

Instrumental/Operant Conditioning:

Learning based on Consequences

- A response or behaviour of an organism is instrumental in bringing about a change in the environment
- A response could be instrumental in getting rewarded
- The study of instrumental conditioning (also called operant conditioning) began with the work of Thorndike (1898)

- B. F. Skinner, the noted behaviourist further elaborated upon operant conditioning
- When an organism operates on the environment through a response, a consequence of the response is produced
- In operant conditioning the most important concept is the concept of reinforcement

Reinforcement

- Reinforcement is a stimulus or environmental event that enhances or increases the chance or the likelihood of occurrence of that response again
- Both positive and negative reinforcements increase the likelihood of a response
- Reinforcers always increase the probability of a response

Positive and Negative Reinforcement

- Positive Reinforcement: Positive reinforcement occurs when a response is rewarded
- Negative Reinforcement: Negative reinforcement occurs when an unpleasant stimulus is removed after a response is made

Primary and Secondary Reinforcers

- Primary reinforcers are associated to satisfaction of basic needs such as food, water, shelter etc.
- Secondary reinforcers are reinforcing because they are associated with primary reinforcers. Money is an example of secondary reinforcer

Punishment and Omission Training

- In punishment a response is followed by an unpleasant or aversive event
- In omission training a desirable stimulus is removed as a consequence of a response
- It is important to note that in negative reinforcement an unpleasant stimulus is removed and in punishment an unpleasant stimulus is added

Learning Outcomes

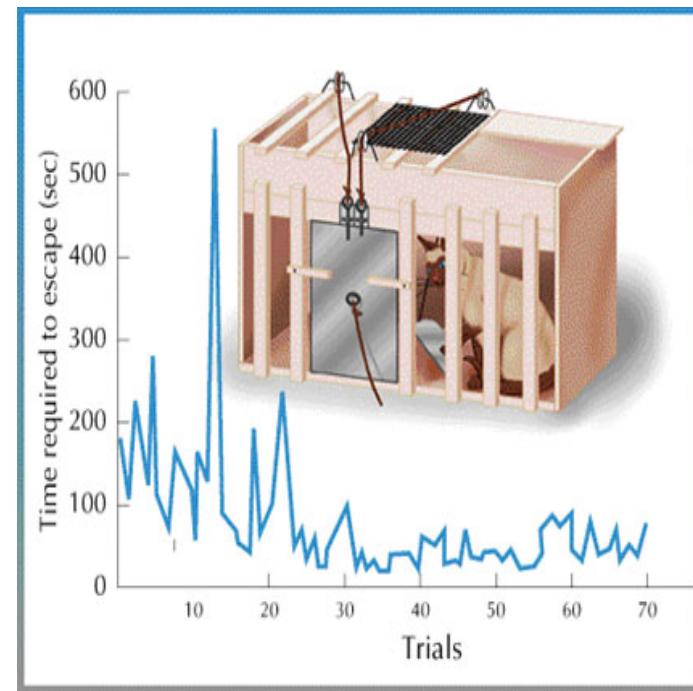
- Positive Reinforcement – Learning to respond in a manner that is rewarding or brings about positive reinforcement
- Negative Reinforcement - Learning to respond in a manner so that aversive factors can be avoided
- Punishment – Learning to put an end to a response that leads to unpleasant stimulus or punishment
- Omission training – Learning to withhold a response that leads to removal of a pleasant stimulus

Thorndike's Experiment - Cat in a 'puzzle box'



Edward L. Thorndike

Puzzle Box Experiment



Trial and Error Learning

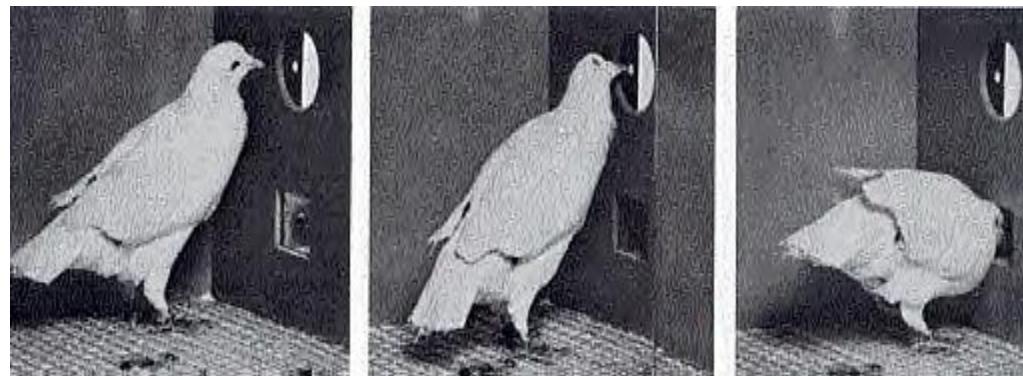
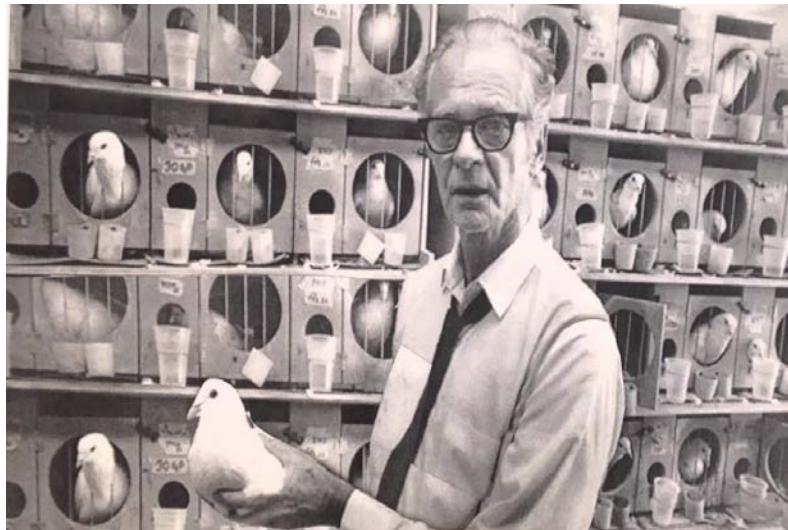
- With increasing trials the cat took less time to make the response that was instrumental in opening of the door of the puzzle box
- The responses that were not instrumental for opening of door gradually ‘stamped out’ and the response that was instrumental in opening of the door was ‘stamped in’
- Thorndike called this as trial and error learning

Law of Effect

- Strengthening or ‘stamping in’ of the response due to positive reinforcement is known as Thorndike’s law of effect
- According to law of effect a response that leads to a positive and satisfying outcome is more likely to occur as compared to responses that do not lead to a positive outcome

Skinner's Experiment with Pigeons

Skinner Box



Skinner – Operant Conditioning

- In operant conditioning behavior or response is followed by consequences
- Skinner's analysis of reinforcement
- A positive consequence increases the response
- Removal of a negative factor increases the response
- In punishment a response followed by a negative outcome reduces the rate of response

Principles of Operant Conditioning

- *Premack's Principle*

An activity preferred by the organism could be used to reinforce a less preferred activity

- *Operant extinction*

A response that is not reinforced loses its strength and weakens

- *Generalization and Discrimination*

Like classical conditioning stimulus generalization and stimulus discrimination take place in operant conditioning also

- *Stimulus control of behaviour and discriminative stimulus*

Stimulus Control – response occurs when the discriminative stimulus is present

Discriminative Stimulus – provides the signal about reinforcement if a response is made

Shaping and Successive Approximation

- Operant conditioning can be used to shape desired behaviour pattern
- In shaping, desired and appropriate responses are reinforced in a stepwise manner
- The responses closer to the final response are reinforced
- Responses that finally lead to the ultimate desired response are reinforced in a successive manner

Schedules of Positive Reinforcement

- Partial reinforcement - reinforcement is not given continuously for each response
- Partial schedules are of two types
 - Ratio schedules – based on number of responses;
 - Interval schedules - based on time
- Fixed-ratio schedule
- Fixed-interval schedule
- Variable-ratio schedule
- Variable-interval schedule
- **Importance of operant conditioning**

- Operant conditioning has been discussed in this lecture – In the next lecture we will discuss observational learning and cognitive learning

Thank you

Shikha Dixit

Professor of Psychology,

Department of Humanities & Social Sciences,

Indian Institute of Technology Kanpur,

Kanpur, 208016, U.P., India

Email: shikha@iitk.ac.in

Module 5: Learning

Lecture 5: Cognitive Basis of Learning

Some Questions

- Do we always learn only through associations?
- What is the role of cognition in learning?
- Do we always learn through receiving reinforcement directly?
- Can we learn by watching others?

What is Cognitive Learning?

- Cognitive learning refers to the emphasis paid to the role of cognitive processes in learning
- Complex human learning cannot be understood in terms of stimulus-response associations
- Memory plays an important role in forming a cognitive representation of the learning situation
- Experiment done with Chimpanzees (Menzel, 1973)

- The search path of chimps followed the least distance principle
- The pattern of search demonstrated as if a structure of the scenario was formed in the memory of animals that was later retrieved during search for food
- Cognitive processes of attention, encoding and storing information, remembering and retrieving information were operating

Observational Learning

Bandura (1977)

- Learning through observation is an important and major form of learning that we experience in daily life
- It is an indirect form of learning because we observe others experiencing the consequences of their behaviour
- Experience is thus vicarious and indirect

- According to Bandura's (1977) social learning theory, learning occurs in a social context by observing the behaviours of others and the outcome of that behaviour
- People who are observed are *models* and the learning process is called *modelling*
- Observational learning was demonstrated by Bandura and colleagues through Bobo doll experiment

- Do children learn aggression through observation of violence in media?
- According to Bandura (1986) the process of observational learning and modelling involves cognitive aspects
- It is a four step process – Attention, Retention, Reproduction and Motivation
- According to Bandura, self efficacy is an important motivational factor in observational learning

Learning by Insight - Wolfgang Kohler

- Learning based on insight was demonstrated by Kohler's experiments with chimpanzees
- Insight learning is the form of learning that involves reorganization and restructuring of the elements in the problem solving domain
- The configuration among the elements of the problem field emerges through insight and not through trial and error

Kohler's Experiments



Characteristics of Insight Learning

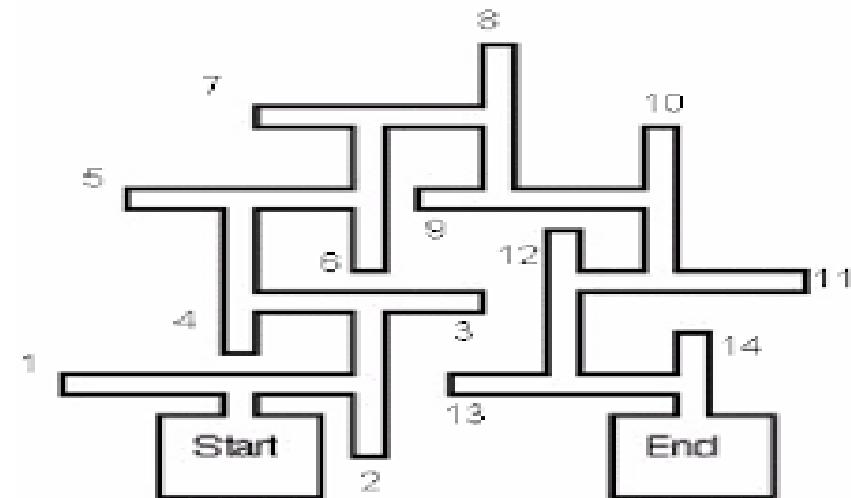
- Insight is dependent on the reorganization of problem elements
- After the emergence of the solution occurs, it can be repeated effortlessly
- Once a solution occurs through insight, it can be transferred to other situations also
- Insight emerges suddenly

Sign learning and Latent Learning

- Latent learning was demonstrated by Edward C. Tolman
- Tolman conducted experiments in sign learning on rats (Tolman, 1948)
- Purposive behaviourism - The rat in the maze learns by acquiring signs leading to a goal, i.e., learning is therefore purposive or meaningful

- Tolman suggested that rats develop a cognitive map of the environment of the maze while exploring it
- The results of latent learning experiments suggested that the rats learnt spatial relationships of the cognitive map of the maze
- Latent learning is in line with sign learning or learning of cognitive maps. It is a kind of hidden learning that is not demonstrated till reinforcement is provided

- Tolman and Honzik (1930) investigated latent learning in rats. Conducted experiments in mazes



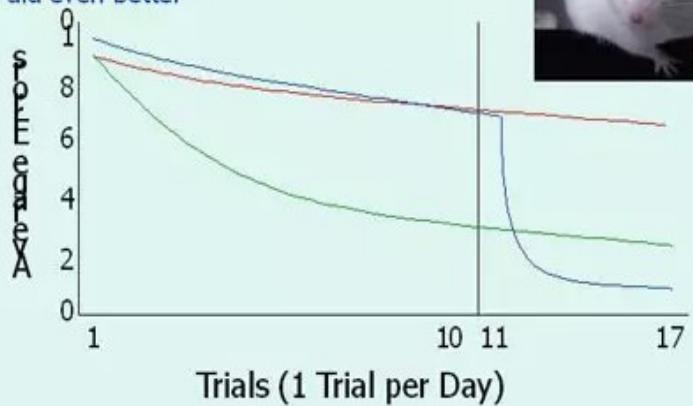
Spatial Learning in Rats

Tolman & Honzik, 1930

Rewarded — learned the maze

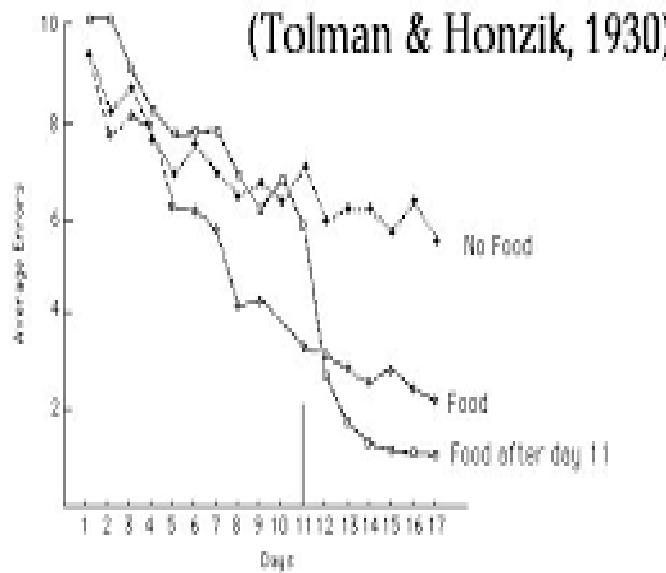
No Reward — improved slightly, getting out was a small reward

Delayed Reward — days 11 – 17 caught up to rewarded group & then did even better



Latent Learning

(Tolman & Honzik, 1930)



learning vs. performance

- The study suggests that the rats actively processed information about the route of the maze
- Tolman's investigation is important as it demonstrates that learning and performance are different and past experience with the learning domain plays an important role

Thank you

Module 6: Intelligence

**Lecture 1: Intelligence – Nature
and Measurement**

Intelligence

- How do we define a construct like intelligence which is so multifaceted?
- People differ in terms of their abilities
- Differences among people due to intellectual ability are important in human context
- Psychologists study such differences and have postulated various theories

Definition of Intelligence

- **Intelligence is one of the most difficult constructs to define.**
- **No single definition captures the nature of intelligence completely.**
- **There are differences among psychologists.**

Some Definitions

- According to Binet Intelligence is the capacity
 - to judge well
 - to reason well
 - to comprehend well
- According to Wechsler intelligence involves
 - Acting in a purposeful manner
 - Thinking rationally
 - Effective dealing with environment

Measurement of Intelligence

Contribution of Sir Francis Galton

- Book - Hereditary Genius (1869)
- He believed that mental excellence was inherited.
- He measured reaction time, visual acuity, skull size and other physical and sensory characteristics.

Contribution of Alfred Binet

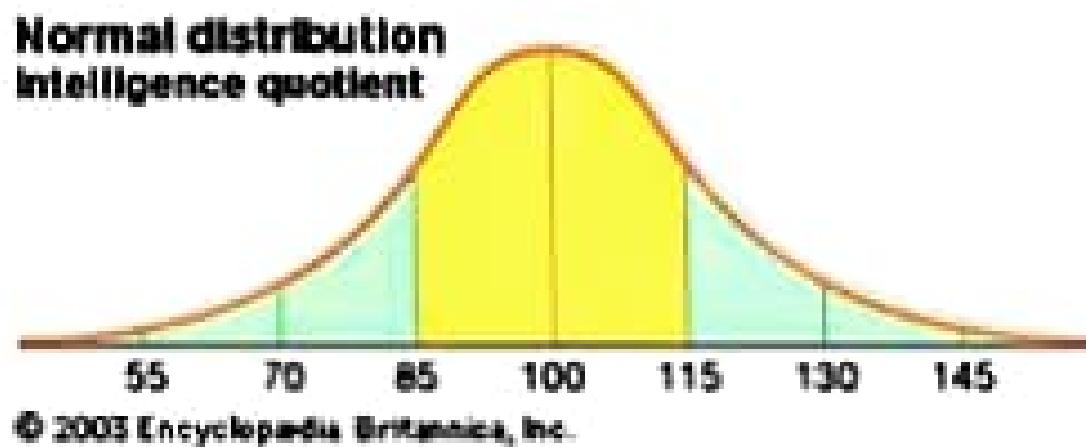
- The first formal test of intelligence was developed by Alfred Binet, a French psychologist.
- He believed that intelligence could be measured by thinking, reasoning and problem solving tasks.
- Along with Theodore Simon, he devised the first test of intelligence in 1905.

Mental Age

- Binet's major contribution was the idea of mental age.
- According to him intelligence was related to age.
- He developed a test to measure mental age.
- Mental age (MA) of a child could be different from chronological age (CA) or biological age.
- Stanford Binet test (1916)

Intelligence Quotient (IQ)

- The ratio of MA to CA is known as IQ or Intelligence Quotient.
- $\text{IQ} = \text{MA}/\text{CA} \times 100$
- When MA is equal to CA the IQ is 100
- The IQ scores are distributed as a bell – shaped curve



- IQ is a numerical value that shows the extent to which an individual's score deviates from the average score of others of same age.

Wechsler Scales

- The Wechsler test has verbal and performance scales.
- This division is based on the type or content of items.
- Wechsler Adult Intelligence Scale (WAIS) and the Wechsler intelligence scale for children (WISC)

Individual vs. Group Tests of Intelligence

- The tests developed by Binet and Wechsler are individual tests as far as administration is concerned.
- Group Tests: Arthur Otis developed two tests - Army Alpha and Army Beta
- After Army Alpha and Army Beta many group tests were developed
- Otis tests and CAT (cognitive abilities test) among others were commonly used

Technical Requirements

- All psychological tests need to fulfil some technical psychometric criteria such as validity, reliability and standardization.
- Intelligence tests also have these criteria.
- Reliability - consistency of test scores
- Validity – a test is valid if it measures what it aims to measure
- Standardization of a test refers to a set of norms for interpretation of test scores and standard procedure of administration

Ability tests: Aptitude vs. Achievement Tests

- **Aptitude tests** - measure of innate ability in a domain
- **Achievement tests** – measure of learning or training in a domain
- **Most intelligence tests** are combination of achievement and aptitude – prior learning and ability get combined.

Testing Conditions

- Two conditions - Static and dynamic
- Static Condition - Standardized procedure for administering the test and giving instructions to the test takers in a controlled and pre defined manner.
- Dynamic Condition - Standard testing session is followed by an interactive session with the expert that who provides feedback about the individual's performance.

Module 6: Intelligence

Lecture 2: Theories of Intelligence

Importance of Theories

- In order to understand the nature of intelligence, it is important to understand the theoretical perspectives of intelligence**

Structure of Intelligence

- Statistical method called Factor Analysis
- A large number of measures of mental abilities can be reduced to a smaller number of categories or factors based on correlations
- A factor permits the interpretation of the relationship among the measures and accounts for the links or correlations

Spearman's g factor approach

- The g factor approach is one of the early approaches outlined by British Psychologist Charles Spearman
- General ability is a common ability necessary for all types of mental abilities
- In addition to the general intelligence factors people also have several specific factors called s factors

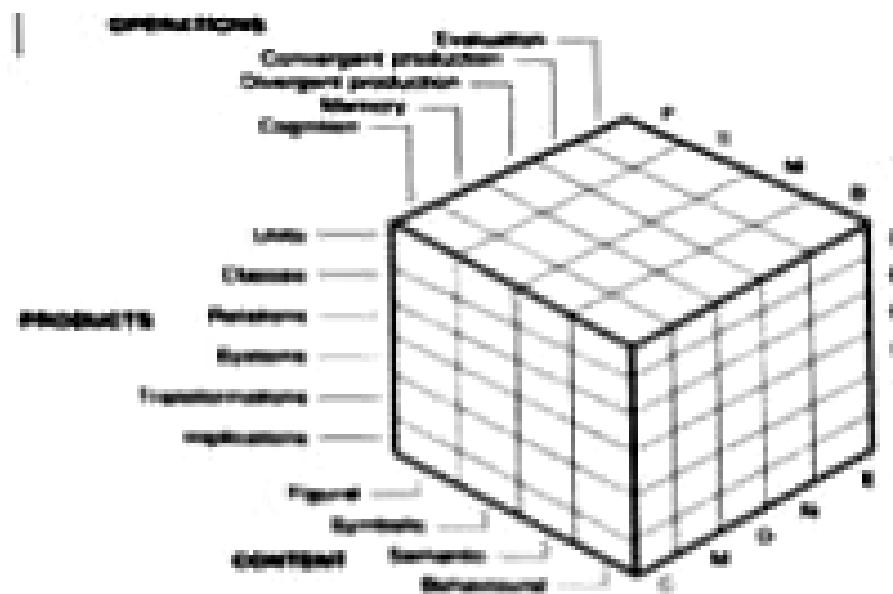
Thurstone – Primary Abilities

- Thurstone did not agree with Spearman's conceptualization of g factor
- Seven primary abilities
 1. Verbal Comprehension
 2. Word Fluency
 3. Number
 4. Space
 5. Memory
 6. Perceptual Speed
 7. Reasoning
- The test of Primary mental abilities

Structure of Intellect Model – Guilford

- According to Guilford content alone is not enough
- The operations performed with the content and the resulting products are very important
- Guilford's model - 4 contents, 5 operations and 6 products. Different combinations of these produce 120 abilities

- Guilford's model has a large number of factors as the conceptualization of intelligence has been broadened



Crystallized and Fluid Intelligence – Cattell (1971) and Horn (1985)

- Two factors: Crystallized Intelligence and Fluid Intelligence
- Crystallized Intelligence - ability to use the knowledge that has been learnt earlier; it depends on memory processes – retrieval of information from LTM.
- Fluid intelligence - abstract reasoning, logical thinking, problem solving, information processing speed and efficiency of short term memory

Three – Stratum Model – Carroll

- Carroll's three stratum model provides an integrated model
- Three levels of mental skills: Narrow (stratum I), Broad ((stratum II) and General ((stratum III)
- Provides a comprehensive view of the psychometric approach to intelligence

Module 6: Intelligence

**Lecture 3: Theories of
Intelligence and Some Other
Aspects**

Cognitive Process Orientation

- Theories with cognitive process orientation focus on cognitive processes and information processing related to mental abilities.
- Developmental theories of intellectual development and componential approach

Piaget – Cognitive Development Theory

- Stages of cognitive development: Sensorimotor, pre operational, concrete operations and formal operations.
- Learning relationships between action and external world, forming mental representations, logical thought and hypothetico – deductive reasoning among other processes
- The processes of adaptation, assimilation and accommodation are important for cognitive development

Bruner's Theory

- Cognitive development takes place as processes develop from action orientation to symbolic representation.
- Three stages of development: Enactive, Iconic and symbolic.
- Enactive stage - dominated by action
- Iconic stage – imagery, mental pictures, visual perception
- Symbolic stage – symbolic activities become prominent

Sternberg's Triarchic theory

- Components outlined in terms of cognitive processes involved in intelligence and types of competencies
- Metacomponents – Higher level cognitive processes
- Performance components - Important for actual task performance
- Knowledge- acquisition Components - Involved in acquiring knowledge and learning from experience

- Sternberg distinguishes among three types of intelligence:
 - Practical Intelligence
 - Creative Intelligence
 - Analytical Intelligence

Multiple Intelligences – Howard Gardner

- Proposed by Howard Gardner - Frames of Mind (1983)
- Broadened the view of intelligence
- Proposed eight types of intelligences: Logical-mathematical intelligence, Linguistic intelligence, Spatial Intelligence, Musical Intelligence, Bodily-kinesthetic Intelligence, Intrapersonal Intelligence, Interpersonal Intelligence, Naturalistic intelligence

Personal and Emotional Intelligence – Peter Salovey and John Mayer

- Emotional intelligence involves the ability to perceive, facilitate, understand and regulate emotions in oneself and others
- Personal intelligence involves ability to introspect and understand self relevant information, creating knowledge about self and others, using this knowledge for decisions and choices and selecting goals
- The Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT) measures four aspects: Perceiving emotions, using emotions for facilitating thought, understanding emotions and managing emotions

- **The Flynn Effect: The rising IQ scores**
- **Genetic and Environmental factors:**
 - Studies have shown that there is influence of genetics on IQ – genetic similarity relates to IQ similarity
 - Studies have also taken environmental factors into consideration
 - Both genetics and environment are important

- Emotion is a complex state involving heightened perception of an object or situation, wide-spread bodily changes, an appraisal of felt attraction or repulsion, and behavior organized toward approach or withdrawal.

- Eysenck

- **Emotional processes involves:**
 - Activation of nervous system (CNS and ANS)
 - Actions depicted on face, body and voice
 - Psychological processes (such as feelings)
 - Interaction with the environment

Theories of Emotion

- Biological
 - James-Lange Theory (1884)
 - Cannon-Bard Theory (1915)
 - Central Motive State (1969)
- Cognitive
 - Schacter-Singer Theory (1962)
 - Lazarus (1991)

James-Lange Theory (1884)

- “We feel sorry because we cry, angry because we strike, afraid because we tremble.”

- James

- William James, an American psychologist
- Carl Lange, Danish psychologist

James-Lange Theory (1884)

Perception of emotion arousing situation in
the environment



Reaction to the situation
(specific set of bodily activities)



Perception of bodily activity resulting into
emotional experiences

James Theory

- “the bodily changes following directly the perception of an exciting fact, and that our feeling of the same changes as they occur is the emotion”
 - (1884/1983, p. 170).
- Bodily sensations occur prior to emotional feeling and not the other way around.

Central Motive State (CMS)

- Bindra's (1969) CMS integrates emotional and motivational states.
- Perception of environment and physiological actions jointly affect a common set of neurons.
- These neural firings are mediated by CMS.
- These firings create autonomic discharge, postural adjustments, and organized motor output.

Schacter's Theory

- Cognitive Appraisal
- Perception of emotion comprises of physiological arousal as well as labeling of that emotional arousal.
- The physiological arousal provides the primary strength to perceive an emotion.

Schacter's Theory

- For instance, an attendant comes along with a patient to a dentist's clinic.
- He has normal breathing and heartbeat.
- He can intellectually realize the patient's fear but can not experience fear or pain.
- This is because of less arousal level.

Schacter's Theory

- Arousal devoid of emotional label inhibits perception of emotion.
- For instance, a player with high level of physiological arousal during the game perceives little or no emotion.
- This is because the arousal is primarily because of non-emotional reasons.

Schacter's Theory

- Compared to other theories, this theory overwhelmingly support the significance of cognitive factors in emotional processes.
- This theory considers different emotions as diverse cognition of the same arousal.
- This is in contrast to other theories.
- Other theories have consider different physiological concomitant for diverse emotions.

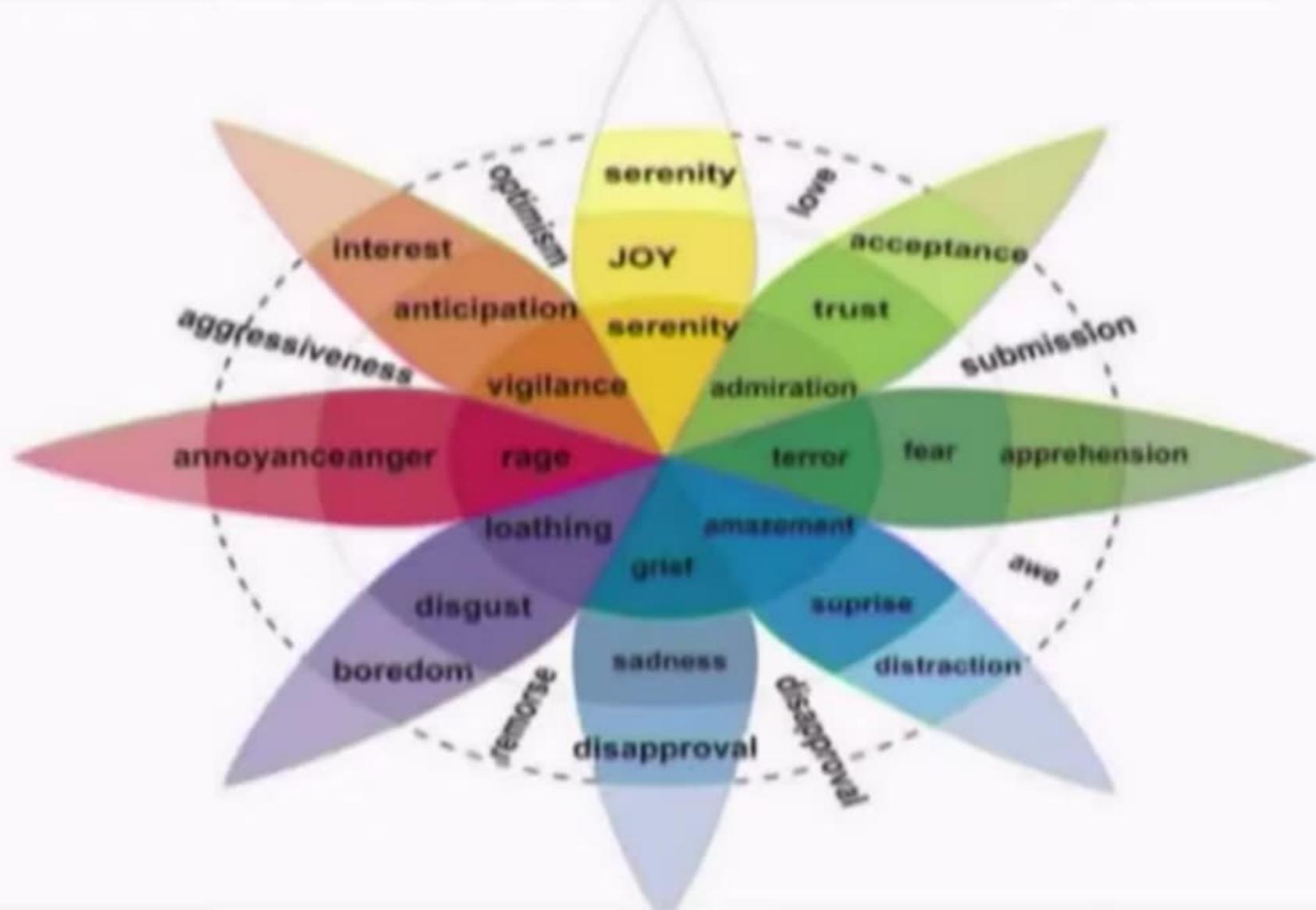
Plutchik (1970)

- According to Robert Plutchik, all emotions can be classified into eight basic emotions or their combinations.
- Relationship of emotions



Plutchik (1970)

- These emotions are multidimensional and the dimensions are-
 - Intensity
 - Similarity
 - Polarity

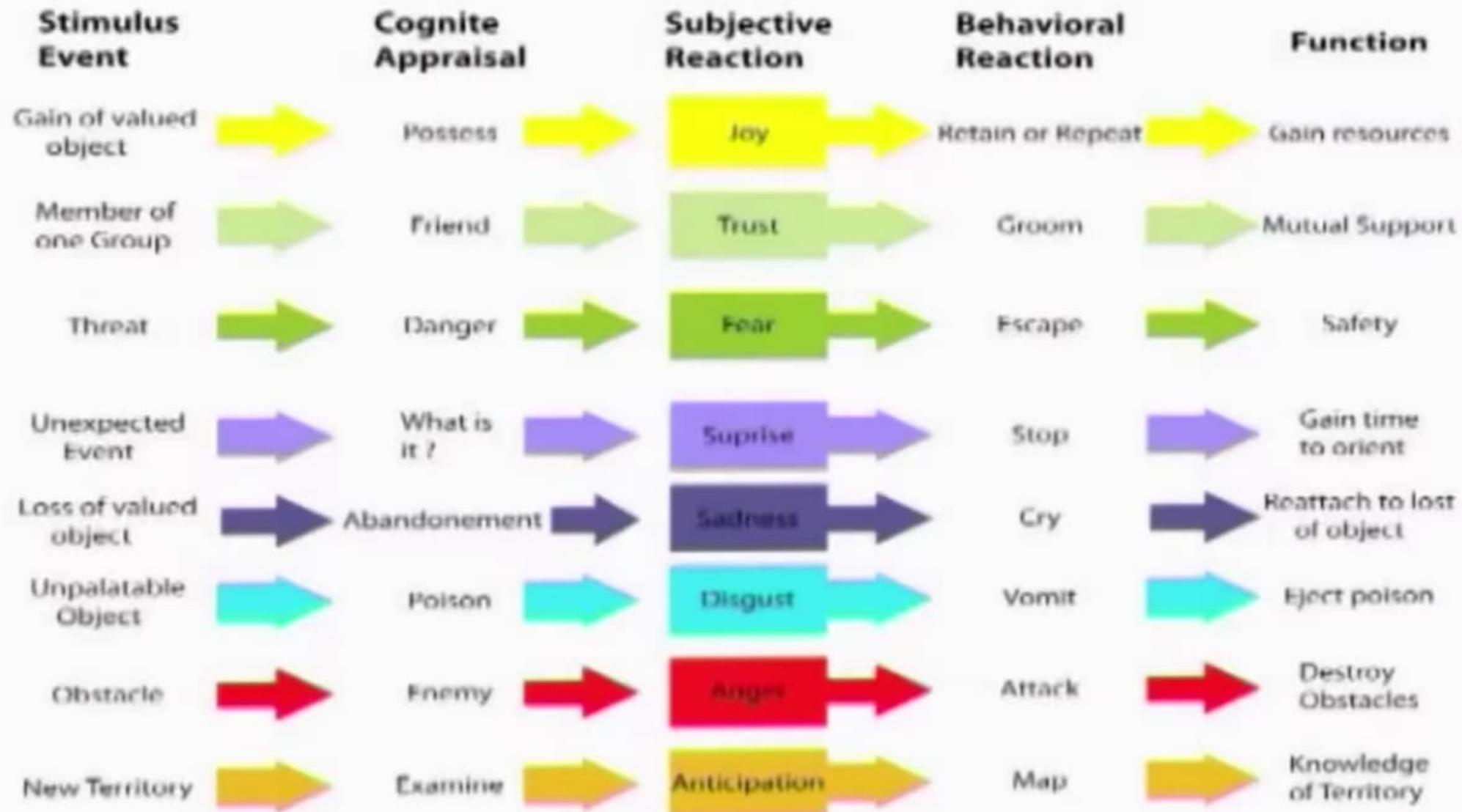


Plutchik (1970)

- Plutchik arranged the primary emotions in a circle and the derived emotions in a third dimension based on intensity.
- There are mixed support for this emotion solid.

often felt	sometimes felt	seldom felt	OPPOSITE
PRIMARY DYADS	SECONDARY DYADS	TERTIARY DYADS	
joy trust	joy fear	joy surprise	joy sadness
love	guilt	delight	<i>conflict</i>
trust fear	trust surprise	trust shame	trust disgust
submission	curiosity	sentimentality	<i>conflict</i>
fear surprise	fear despair	fear shame	fear anger
alarm	despair		<i>conflict</i>

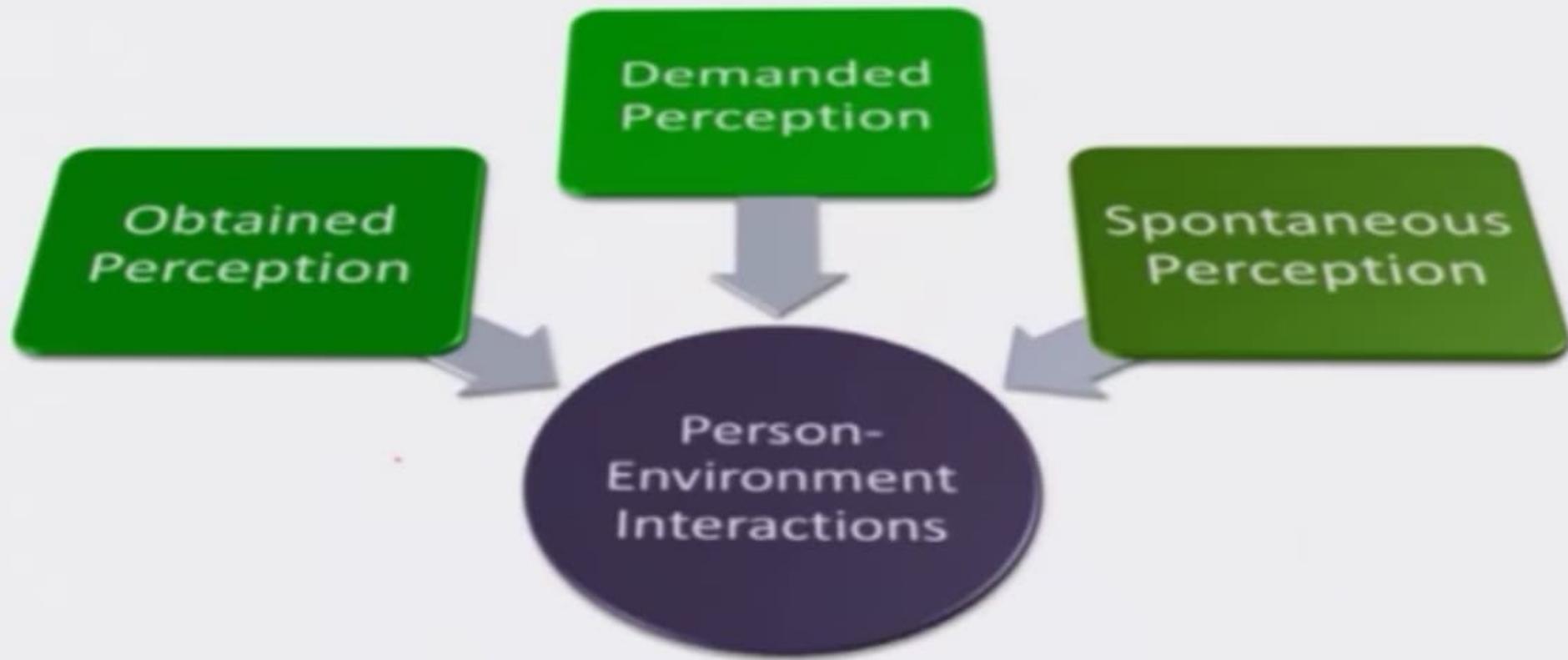
often felt PRIMARY DYADS	sometimes felt SECONDARY DYADS	seldom felt TERTIARY DYADS	OPPOSITE
surprise sadness	surprise disgust	surprise anger	surprise anticipation
disappointment	?	outrage	<i>conflict</i>
sadness anger	sadness anger	sadness anticipation	
remorse	envy	pessimism	
disgust anger	disgust anticipation	disgust joy	
contempt	cynism	morbidness	
anger anticipation	anger joy	anger trust	
aggression	pride	dominance	
anticipation joy	anticipation trust	anticipation fear	
optimism	fatalism	anxiety	



Izard (1972)

- There are nine innate and unique emotions that produce the main human motivational system.
- All of them are discrete because of the facial and physical activities.





Intra-individual processes

Memory: It can be obtained, demanded or spontaneous

Imagination

Proprioception of facial-postural or other motor activity

Endocrine and other autonomic activity

Spontaneous activity of the neuromuscular systems

Paul Ekman

- Performed cross-cultural research (facial expressions) on the Dani and Fore tribesmen (isolated, stone age culture) of Papua New Guinea.
- He concluded that the facial expression of some basic emotions is innate.

Paul Ekman

Basic Emotions

Happiness

Sadness

Anger

Fear

Disgust

Surprise

Basic Emotions

- Fundamental characteristic that are different from other emotions.
- Specific antecedent events bringing about a given emotion in everybody.
- For example, goal obstruction generates anger.
- This is true for everybody.

Basic Emotions

- **Each basic emotion is distinctly expressed on the face.**
- **These expressions are universal.**

Emotions in Infants

- Michael Lewis' developmental theory (1993) suggest that infants are endowed with the inborn cognitive capacity to have a subset of emotions such as joy, sadness, fear, anger, surprise and disgust.

Lewis' Developmental Theory

*Attainment of
remaining
emotions*

*during two
cognitive
developments*

- Acquisition of self concept
- Acquisition of the SRGs (standards, rules, and goals) of one's society

Lewis' Developmental Theory

- For example, emotions such as envy, empathy, embarrassment, pride, and shame can not be experienced without realizing one's own position with respect to others.
- This implies that the two fold cognitive developments are not needed for experiencing and expressing the basic emotions.

Facial Expressions in Infants

- It is intricate to draw discrete negative expressions from a crying bout of the infants.
- The infants tend to cry in all negative situations. A close look at the crying face illustrates interesting patterns.

Facial Expressions in Infants



Lowering of the eyebrows, corner of the lips pulled to a side, opening of mouth and raising of cheek

The crying face has a mixed feature of anger and distress both



Strong Cry



Moderate Cry



Moderate Cry



Weak Cry



Facial Expressions in Infants



Muscle contraction near eye and upward lifting of cheeks

Ekman (1994) has made a distinction between joyful and non-joyful smiling

Facial Expressions in Infants



Very strong smile, Open mouth



Minimal smile, Open mouth



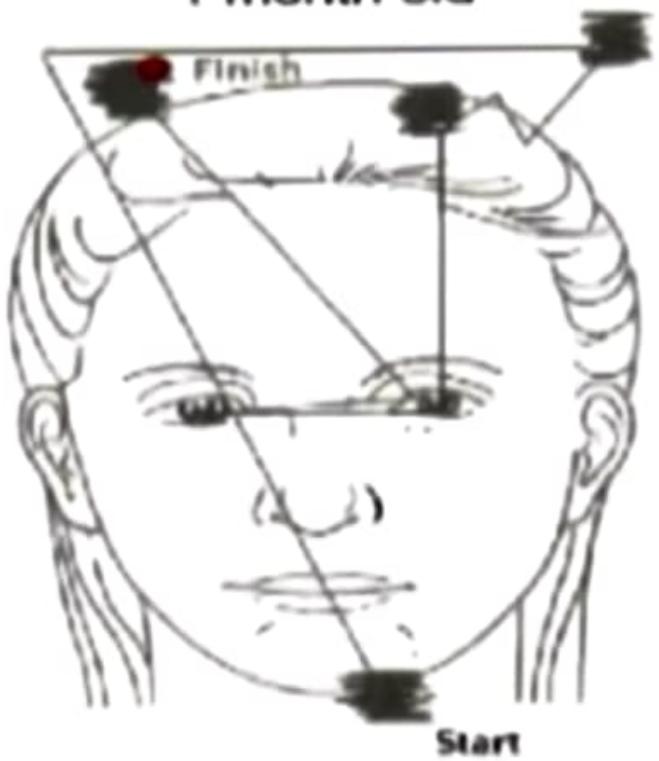
Strong smile, Closed mouth



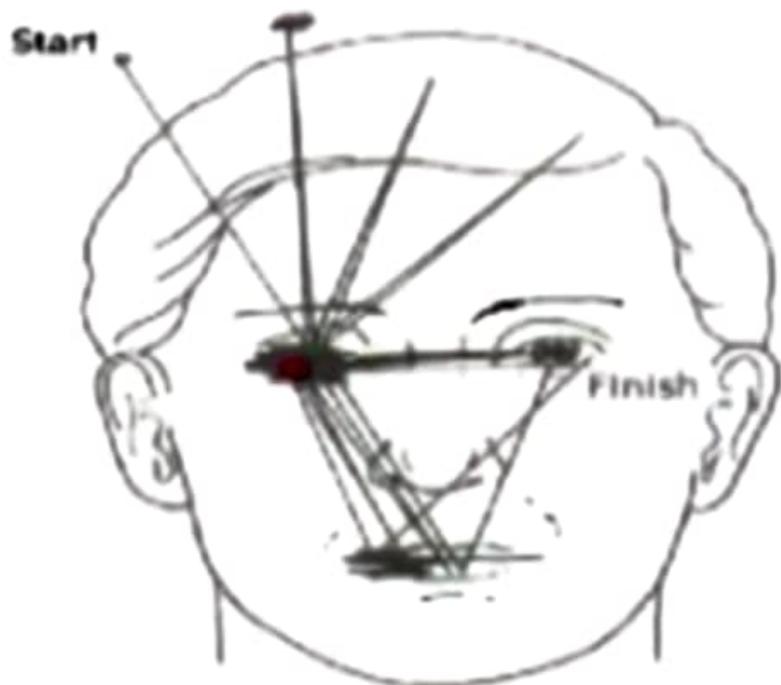
Strong smile, Closed mouth



1 month old



2 month old



Emotions in Infants



Between 18-36 months	Use of emotional words in their conversation
3 Years	Identification of emotions and situations provoking them
4 Years	Accurate matching of basic emotions (happy, mad, sad, and surprised) with the correct corresponding facial expressions
6 Years	Children adept to interpreting emotions at 3 years continue to be better

Emotion & Memory in Children

- Emotional memories mostly involve the attainment (happiness) or blocking (sadness, anger) of personal goals in children as well as adults.

Emotion & Memory in Children

- Children have a better recall of emotional behaviour as compared to emotional labels and non-emotional behaviours.
- For example, memory of an outing with the parents, receiving a gift from the father, and so on.

Culture & Emotion

- Friesen (1972): Participants had to view a stressful film alone and with the experimenter.
- Pan-cultural facial signals were observed during spontaneous expression of emotions in isolated condition (viewing the film alone).
- Culture-specific expressions were observed in social reciprocation condition (viewing the film with the experimenter).

Culture & Emotion

- Friesen (1972): Participants had to view a stressful film alone and with the experimenter.
- Pan-cultural facial signals were observed during spontaneous expression of emotions in isolated condition (viewing the film alone).
- Culture-specific expressions were observed in social reciprocation condition (viewing the film with the experimenter).

Culture & Emotion

- The expression of happiness is encouraged at the cost of expression of sadness in individualist societies, whereas collectivist societies cherish the reverse.

Culture & Emotion

- Less public expression of negative emotions in collectivistic societies.
- On the other hand, individualistic societies (such as North America), ‘may sanction the communication of these emotions more, as they relate to individual freedom to express and perceive negative emotions’.

- Matsumoto (1989, p. 101)

Culture & Emotion

- In collectivistic society people forgo negative emotions in order to support group standards.

Culture & Emotion

- “Facial expressions of emotions are governed both by mechanisms associated with facial side (neuro) and by learned display rules (cultural)”
 - Mandal, Harizuka, Bhushan, & Mishra (2001, p. 395)

Culture & Emotion

- Elfenbein and Ambady (2002, 2003)- Although, the recognition rate was reasonably stable across countries, the recognition of the six basic emotions was easier for the own ethnic group compared to others.

Culture & Emotion

- The ecocultural framework of Berry (1976) and his colleagues (Berry, Poortinga, Segall, & Dasen, 2002) talk of three kinds of antecedental influences-
 - ecological indices
 - sociopolitical indices
 - aggregated psychological characteristics

Facial expression of emotion

- To understand nuances of facial expressions, psychologists have taken various factors into account such as
 - culture (Western, non-Western)
 - type of participants (literate, preliterate)
 - type of expression (posed, spontaneous)
 - stimulus type (static, videotaped)
 - response format (matching/ labeling task)

Facial Asymmetry

- The two sides of the human face are not equally pronounced during emotional expressions.
- Emotions are expressed more intensely on the left side of the face.

Facial Asymmetry

- Socially appropriate cues are apparent on the right side of the face, whereas personalized feelings are visible on the left side of the face.
- Right hemisphere deals with emotional processing whereas the left controls these processes in terms of social appropriateness.

Facial Feedback Hypothesis

- The facial feedback hypothesis (Buck, 1980) lay emphasis on the feedback received from the facial muscles in the subjective experience of emotion.

Facial Expressions: Musculature Analysis

- Ekman (1992) asked the participants not to pose emotions but to follow muscle instruction to produce universal facial expressions.

Facial Expressions: Musculature Analysis

- The voluntary performance of 'certain facial muscular actions generated involuntary changes in autonomic nervous system (ANS) activity' (p. 64).

Facial Expressions: Musculature Analysis

- The changes in ANS activity may be 'unique to the specific task' (rather than specific to emotion) and 'any connection between expression and physiological change [could be] learned not hard-wired'.

- (Ekman, 1992, p. 65)

Facial Expressions: Musculature Analysis

- FACS (Facial Action Coding System; Ekman & Friesen 1978)
- MAX (Maximally Discriminative Facial Moving Coding System; Izard 1979)
- FEAT (Facial Expression Analysis Tool; Kaiser & Wehrle 2001): Automatically measure facial expressions using FACS expert system.

Basic Emotions

- Each basic emotion elicit organized set of responses in each person.
- For example, heartbeat and blood flow increases in the state of anger.
- As a consequence disproportionately high amount of blood goes to one's hand, thus preparing a person to fight.
- Irrespective of whether one actually engages in a real fight or not emotion prepares the body for it.

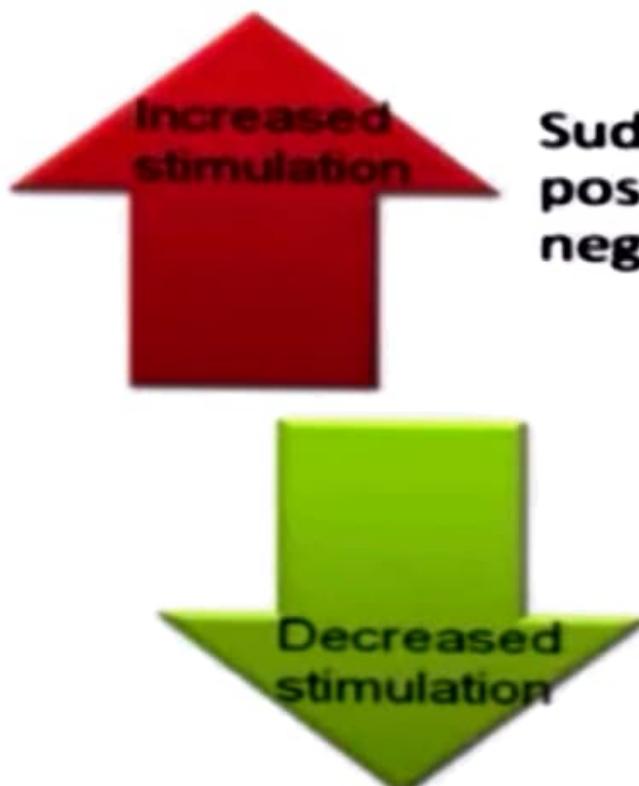
Survival Significance

- There is an innate tendency to prioritize threat stimuli compared to the neutral stimuli in terms of processing.
- Because of their survival significance the brain identifies threatening stimuli very fast.
- Therefore, fear-inducing animals such as snakes or negative emotional expression such as anger are identified relatively fast.

Activation of Emotion

- Elicitors of emotions:
 - Neuro-chemical
 - Sensorimotor
 - Motivational
 - Cognitive

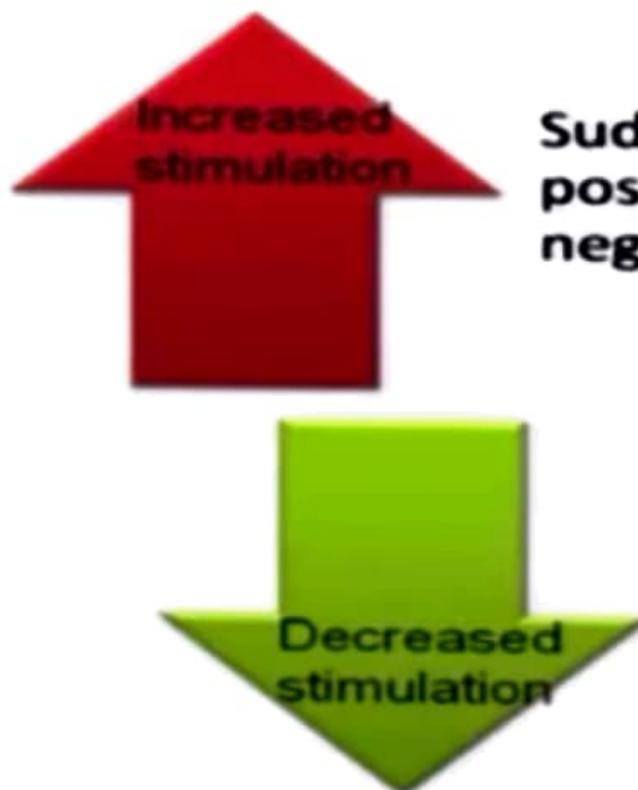
Activation of Emotion



Sudden increase can activate positive (interest) as well as negative (fear) emotions

Sudden decrease only activates positive emotions (joy)

Activation of Emotion



Sudden increase can activate positive (interest) as well as negative (fear) emotions

Sudden decrease only activates positive emotions (joy)

Activation of Emotion



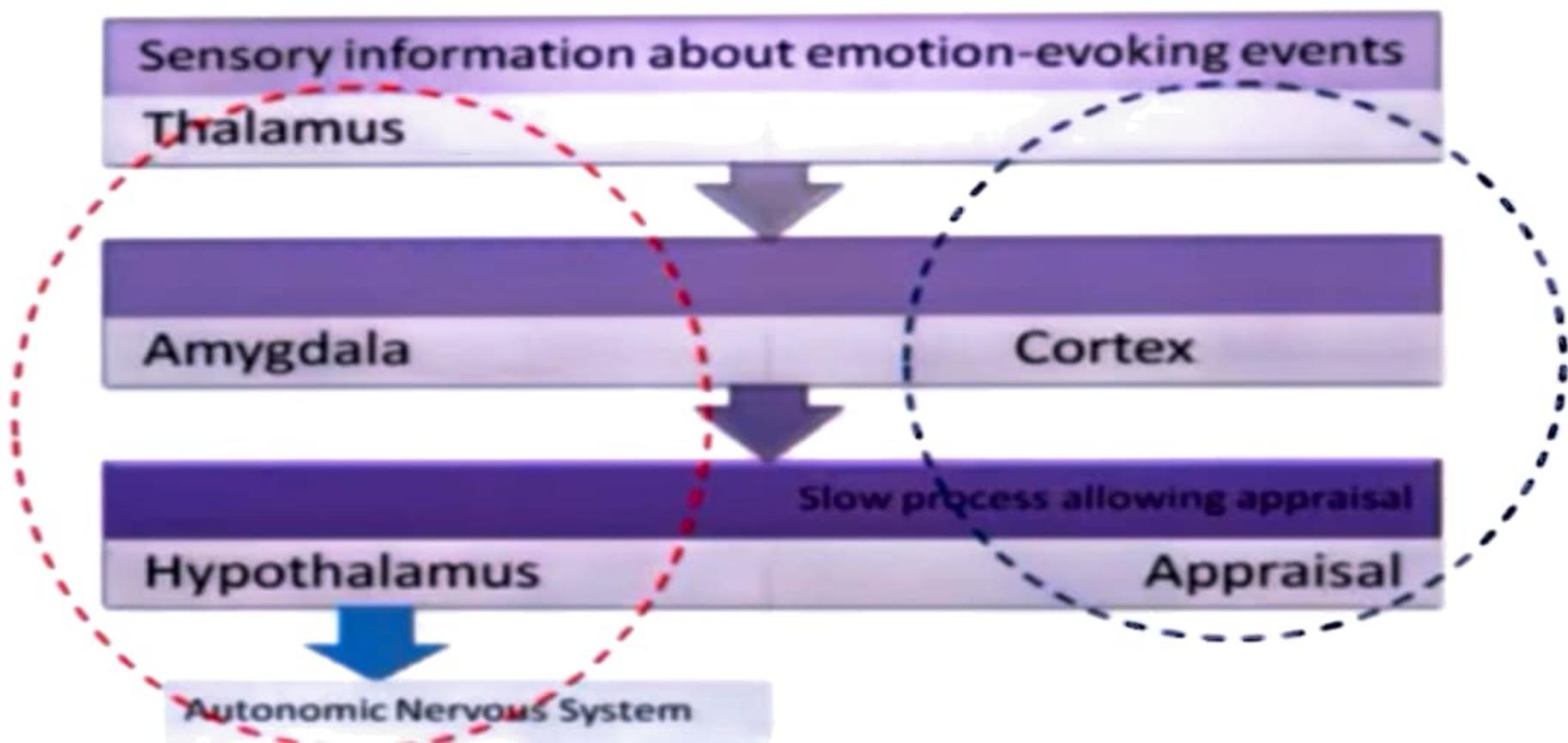
Affect

Experience
of
emotion

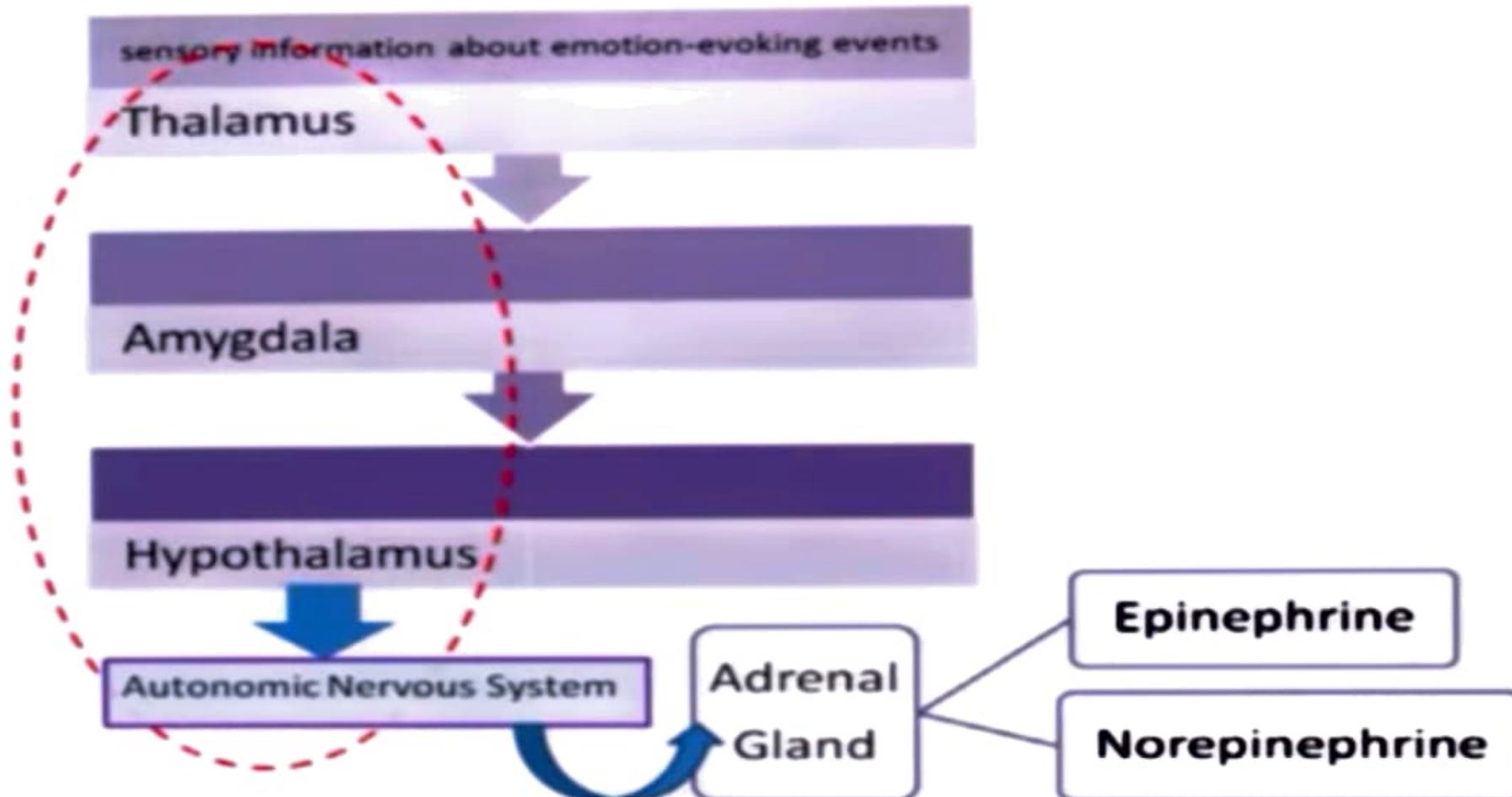
- Activation of brain

- Activation of ANS

Affect



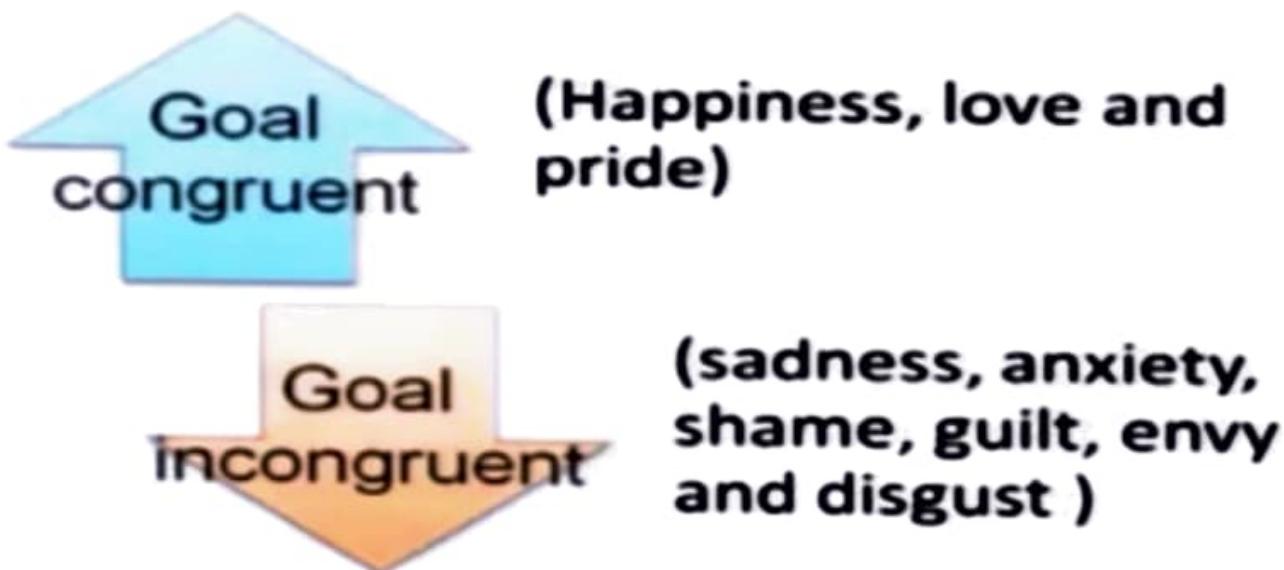
Affect



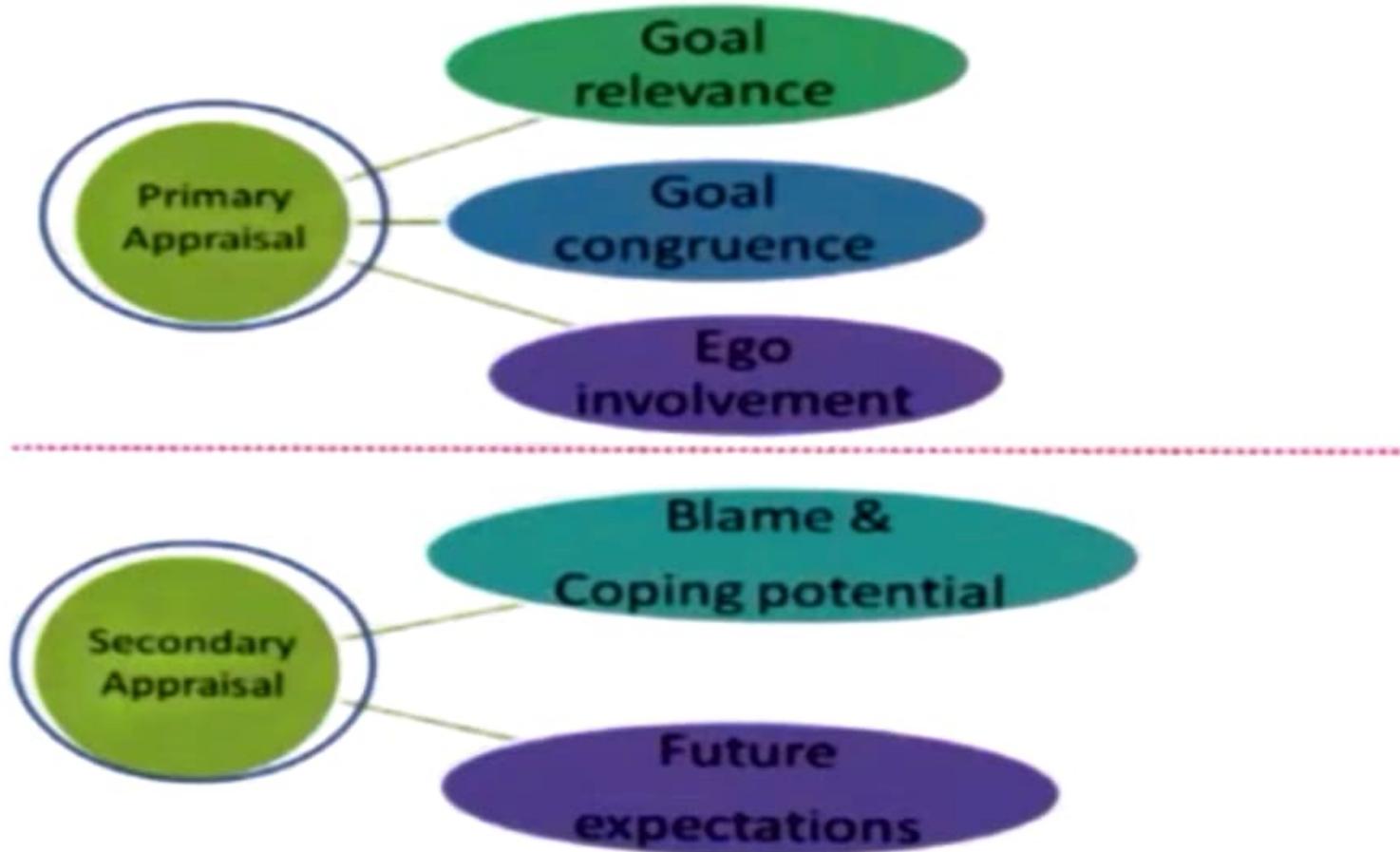
Affect

- Release of the epinephrine and norepinephrine accompanies many emotional states, but emotions differ at the biological level—
- Different emotions have different patterns of brain activation.
- Different neurotransmitters are involved in different emotions.
- Different emotions have different patterns of autonomic nervous system activity.

Appraisal of Emotions



Appraisal of Emotion



Aspects of Emotions

- **Feelings:** It entail private and subjective feeling.
- **Physiological arousal:** It is a state of distinctive somatic and autonomic responses.
- **Action orientation:** Fight-flight

Introduction to Psychology
Prof. Braj Bhushan
Department of Humanities and Social Sciences
Indian Institute of Technology, Kanpur

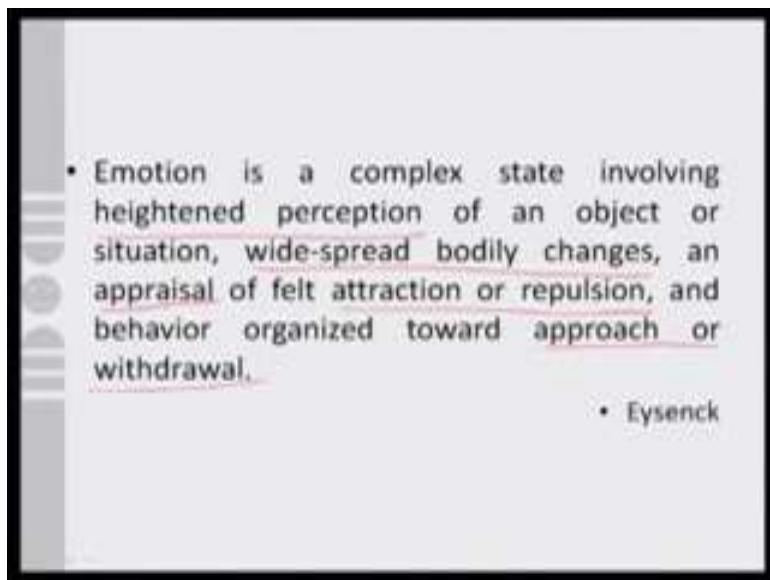
Lecture - 23
Emotion - Theories of Emotion-1

Now that we have talked about perception; we have also seen how we learn things, how we memorize, how we forget things. Recollect your experiences, situations where somebody shared a good news with you and you were full of joy. Your happiness was glaringly visible on your face. You heard the news of death of beloved one and you were extremely sad. You thought something will not happen and it happened, and you were caught by surprise.

These are some of the things that we are going to talk about in this very course as part of emotion. Where first you try to understand what emotion means, how psychologist they have tried to understand human emotion, the entire effective process per se. And because we will have a limitation of only 20 minutes lecture distributed across 6 lectures.

So, we would try to also see not only the major theories that tries to explain emotion, but also how emotion and understanding of emotion has grown and become wider and wider helping us understand how we feel, what we feel, and why do we feel what exactly we feel. So that is all about the topics that you would be talking about. Just to define emotion I am taking this very definition given by Eysenck.

(Refer Slide Time: 02:08)

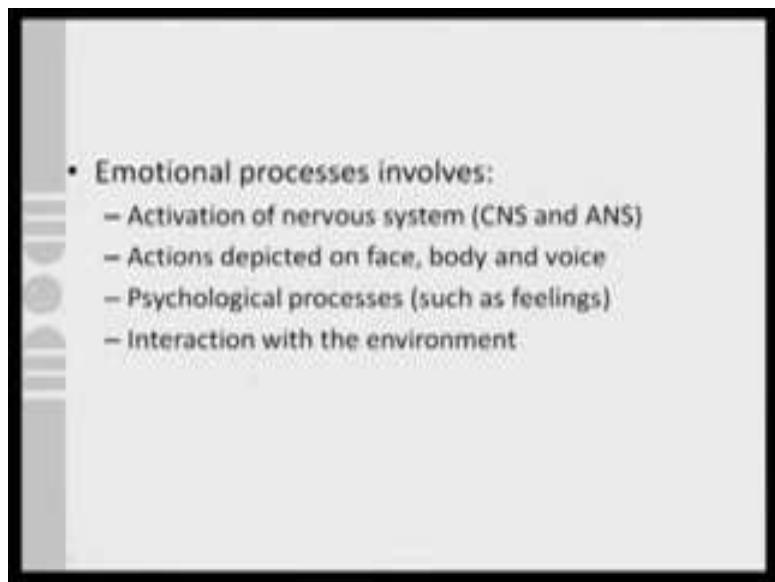


Who says that ‘emotion is a complex state involving heightened perception of an object or situation, wide spread bodily changes, an appraisal of felt attraction or repulsion, and behavior organized towards approach or withdrawal. If you look at this very definition you will come to know whole variety of things that are associated with emotion. First, that it has to do with heightened perception. You perceive an object, you perceive a situation and then you have heightened degree of perception which leads to a complex state. What is that complex state? And if I now break up this into say the complexity that Eysenck talks about it would be something like this.

The first thing you have is the heightened perception, bodily changes, appraisal which is either attraction or repulsion, and then behavior which either follows an approach or withdrawal mechanism. You can understand that perception has to be heightened the body will undergo certain changes you will go for an appraisal mechanism, you will think about it. Why, whatever is happening is happening, what does that mean. How relevant, how significant that is. And based on that you will either move towards the source of attraction or repulsion or you would move away from it.

So if you move towards the object then it is attraction, if you move away from the object it is repulsion. And then the entire behavioral manifestation, the behavioral output will either be an approach or an avoidance response. So, whole lots of issues are involved in emotion.

(Refer Slide Time: 04:14)



Now, emotional processes largely involve four things. First activation of nervous system, so when we say activation of nervous system it could be activation of the central nervous system as well as the autonomic nervous system. For instance, you watch a movie and when you see the hero chasing the villain, you realize that the sequence that you see on the screen actually makes change in your heart beat; your beat becomes faster because the heart beat has increased so the pulse rate is by default going to increase. The respiration rate might change. The sensitivity, the flow of current on the surface of the skin will undergo a change, what is called as GSR; Galvanic Skin Response. So the nervous system actually becomes activated, that is one of the important process involved in emotions.

Second the action gets depicted on face body and voice. The facial expression changes and the right looking at your face one can understand whether you are experiencing particular type of emotion or not. To say happiness, sadness, disgust, surprise, all these things can very easily be understood just by looking at the face of the individual. Two, the bodily mechanism; the gestures, the postures that will also get influenced, so if you are happy your entire gestures and postures will very clearly reflect how activated you are. Similarly, you will be no depicted by your gestures and postures has little withdrawn say for instance if you are extremely sad, and this change in the emotion is also visible on the face. So, voice modulation takes place depending on the emotion you are experiencing.

Three, emotions has psychological process embedded into it. The whole concept of subjective experience the feeling. So, what actually happens to your body, what happens in the normal nervous system whether it is central or autonomic or what happens in the face, what happens to your voice. These are the changes that can be examined, that happens to you but then at the end of these events you finally derive a feeling out of it. What is that feeling? That subjective feeling that you derived in a given situation that is an important. And one of the perhaps most important concept associated with emotional process.

And then the fourth one is the interaction with the environment. Depending on what you feel, you will decide your course of interaction with the environment. If you consider the environment to be hostile, the environment which is full of fearful elements you are by default going to withdrawal yourself. So, you are over all engagement with the process will not be visible. Whereas, if you realize that the environment is full of signals that makes you very very happy or it is a full of surprise element, your involvement with your environment increases therefore, the pattern of interaction that one will show to the environment will also be decided by the emotion that one will experience. So, these are the four important processes that are involved with emotion.

We will now very succinctly try to understand the theories which have tried to explain the process of emotion. For convenience what I have done is that I am dividing this theories is into two major segments.

(Refer Slide Time: 08:30)

Theories of Emotion

- Biological
 - James-Lange Theory (1884)
 - Cannon-Bard Theory (1915)
 - Central Motive State (1969)
- Cognitive
 - Schacter-Singer Theory (1962)
 - Lazarus (1991)

The biological theories and the cognitive theories; and beside these two theories these two set of theories are there.

(Refer Slide Time: 08:40)

Theories of Emotion

- Plutchik (1970)
- Izard (1972)
- Ekman (1972)

we will also like to look are the theories given by Plutchik, Izard and Ekman, because they have tried their best to classify emotion and to (refer time 8:54) the basic form the purest form of emotion which is not confounded by any other subjective experience. So, what are those basic emotions, and how is that two emotions they mix together, and what

is the third thing that gets generated out of it. So, these things will also like to discuss here.

So, let us first begin with James-Lange's theory which was proposed in 1884.

(Refer Slide Time: 09:22)

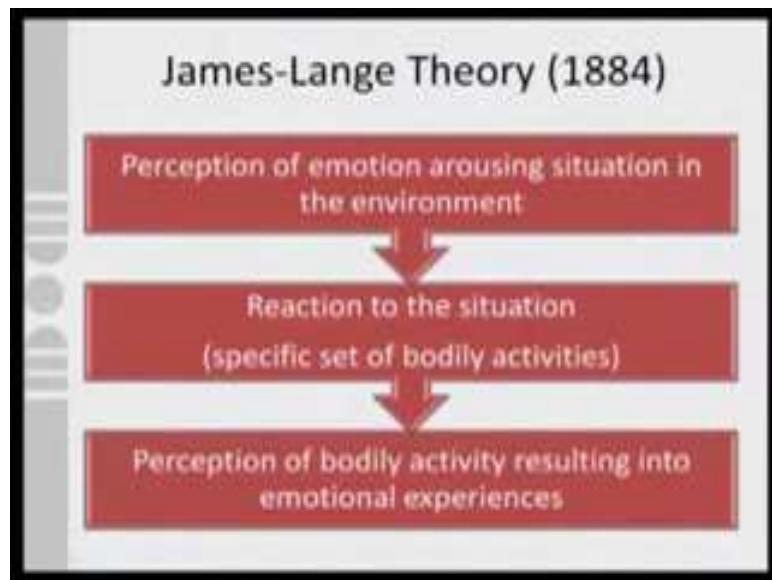
James-Lange Theory (1884)

- "We feel sorry because we cry, angry because we strike, afraid because we tremble."
- James
- William James, an American psychologist
- Carl Lange, Danish psychologist

I am quoting him he said “We feel sorry because we cry, angry because we strike, afraid because we tremble”. So, what actually he was saying was that it is not that you first feel the emotion and then you respond to it. He said that you become cry therefore you feel sorry in a given situation. So, because you are scared you tremble therefore you are trembling behavior gives you a feel of fear, you are afraid of something. This means what we otherwise think that we feel and then the process takes place, he says the reverse of it.

Now, when William James was thinking about how human being experiences their emotion, along with this American psychologist there was somebody else a Danish psychologist called Carl Lange he also proposed similar type of theory. And therefore, although this theory was not an outcome of collaborative work, but in the literature you will find that the credit has been shared with both of them, both of them have been recognized for proposing the this theory and therefore this is called James-Lange Theory.

(Refer Slide Time: 10:59)



Now, what this theory says is that first we perceive emotion that arises out of a situation in the environment. There is a situation in the environment and you perceive it. This perception of emotion leads to reaction to the situation which in turn basically could get reflected into terms of specific set of bodily activities. And when we react to the situation we then perceive our bodily activities, the perception of the bodily activity then finally results into an emotional experience. Let us understand by this very example.

What did you see here primarily this man was afraid of the dog. Now, why was this man running? Because this man was scared of the dog, according to James-Lange Theory this man actually saw the dog in the environment. So, there was a perception of the dog in the environment, two he react to it he started running away, because he is started running away therefore third step comes where he perceives that he is sweating his heart beat is increased. This whole experience subjective experience of running away from the object that is internalized and then it finally results into the perception of fear.

Now, think of a situation what James-Lange says is that you have the object, the situation present in the environment, you respond to it and accordingly you feel the emotion. The example that we saw right now was that a man is scared of dog and according to James-Lange his fear of dog is governed largely by the fact that he is trying to run away from the dog. Look at this very example and interesting example where you find small child 14 month old child playing with a python.

(Refer Slide Time: 13:25)



The previous example we saw where this adult man was running away from the dog because he interpreted that this is a fearful object in the environment he ran away, and because he started running away he experienced fear. In this very example the python you can see he has **scrolled** and then the baby is playing at least the feet is under the body of the python, the hand is too close to the body of the python, and there is no experience of fear at all.

Now in this very example this baby is not scared of the python because she is not considering the object, she does not perceive the object in the situation to something that she should be skeptical about it and run away. Because she is not running away therefore that fear is not induced. Whereas, most of us if we are put in this very situation we would be extremely scared. So, this is what was James-Lange Theory.

(Refer Slide Time: 14:44)

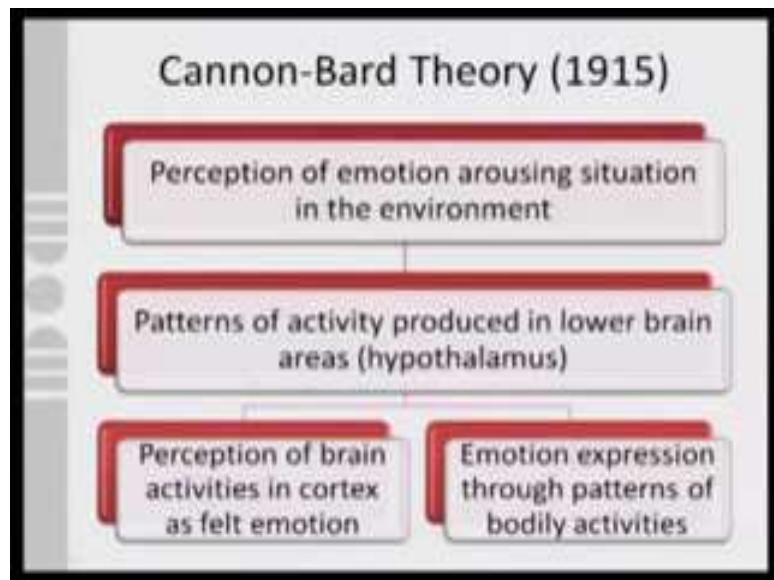
James Theory

- "the bodily changes following directly the perception of an exciting fact, and that our feeling of the same changes as they occur is the emotion"
 - (1884/1983, p. 170).
- Bodily sensations occur prior to emotional feeling and not the other way around.

James theory further says, I again quote him that "the bodily changes following directly the perception of an exciting fact, and that are feeling of the same changes as they occur is the emotion. So, he was trying to explain emotion as the feeling of the changes that takes place in the body. And this theory further says that the bodily sensations they occur prior to the emotional feeling and not the other way around.

Most of us we think the other way around that we have the emotion it is the emotion that leads to bodily changes, whereas James-Lange Theory proposes that we have the bodily changes first the sensation first. And it is this bodily sensation change there that finally leads to the experience of a given emotion

(Refer Slide Time: 15:36)



We come to the other theory now. Cannon-Bard Theory came in 1915, and this was further revision of James-Lange view point. They said that perception of an emotion is based on the situation in the environment which is of course arousing enough, so the person concerned perceives the emotion arousing situation in the environment and this in turn leads to pattern of activity in the lower brain areas. Because, the activity has now right from the perception of the situation in the environment has now gone to certain type of pattern that is produced in the lower brain areas therefore, two things now simultaneously happen; one perception of the brain activity in the cortex which is felt as an emotion, and simultaneously the emotion expression that takes place to the pattern of bodily activities.

So, the change between James-Lange Theory and Cannon-Bard Theory was that James-Lange Theory said that we perceive the emotion arousing situation in the environment then we respond, and because our bodily response takes place we look at our own response pattern and therefore we experience the emotion. Cannon-Bard made a change here they said perception of emotion arousing situation does takes place, but then this perception leads to certain type of activity that takes place in the lower brain areas. And that pattern of activity that takes place in the lower brain area leads to two simultaneous things. At the same time when we experience the emotion because of the activities in the brain we also experience our emotion through the bodily activities.

So, the bodily response and the felt experience of the emotion both of them they go parallel to each other. This was Cannon-Bards Theory.

(Refer Slide Time: 17:56)

Central Motive State (CMS)

- Bindra's (1969) CMS integrates emotional and motivational states.
- Perception of environment and physiological actions jointly affect a common set of neurons.
- These neural firings are mediated by CMS.
- These firings create autonomic discharge, postural adjustments, and organized motor output.

The third theory which is considered at the biological framework is the Central Motive Theory given by Bindra. Bindra's theory says that you need to integrate emotional and motivational states to understand how human beings experience the emotion. And according to Bindra the perception of environment and the physiological actions jointly affect a common set of neurons. These neural firings are mediated by the Central Motive State. And these firing they create the autonomic discharge, postural adjustments, and they also organized the motor output.

(Refer Slide Time: 18:32)

Central Motive State (CMS)

- CMS is not autonomous of external conditions and can be altered by experiences, but also has inherited components.
 - (Candland et al., 1977)
- Thus, CMS can be classically conditioned.
- One can be trained to react in a certain manner to a stimuli.

Therefore the Central Motive State actually is not an autonomous state of external condition and can be altered by experiences, but also has certain inherited components. And therefore, it is also suggested that the Central Motive State can be classically conditioned. Means one can train to react in a certain manner to a certain stimuli.

Right now the example you saw the baby playing with a python. The Burmese father who recorded this who was basically trying to propagate the message that people should not be scared of animals and they should take care of all animals including animals for whom we have great degree of fear like snakes.

Now, he was basically trying to train not only his own baby, but also try to he was trying to give message to the society. Basically this is what see a message that, one can be even trained to react in a certain way you can be trained not be scared of a python which is usually against what is commonsensically perceived.

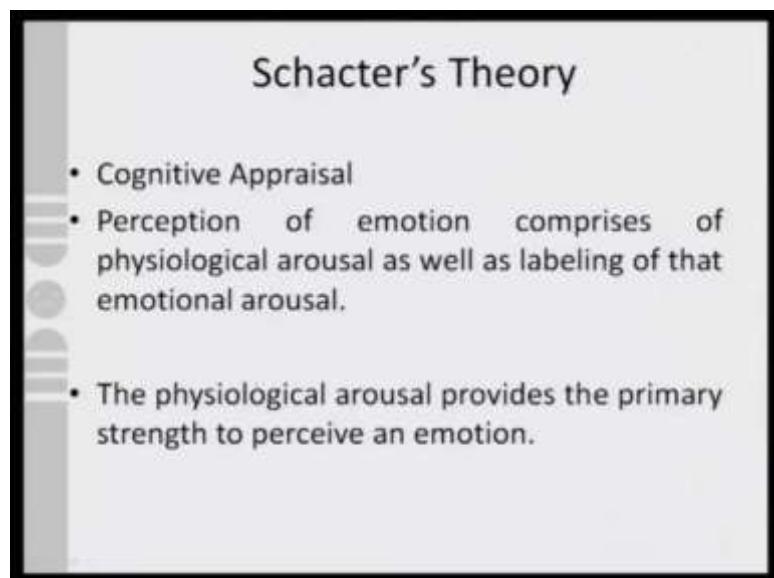
Key words - emotion, james, lange, Cannon bard, central motive state

Introduction to Psychology
Prof. Braj Bhushan
Department of Humanities and Social Sciences
Indian Institute of Technology, Kanpur

Lecture - 24
Emotion - Theories of Emotion – 2

Now, that we have discussed the biological theories trying to explain emotion, we are now going to talk about the cognitive theory. So, the Schacter's Theory is something that talks about the cognitive appraisal. Appraisal is a mechanism where you meta think about the experience that you are having.

(Refer Slide Time: 00:33)

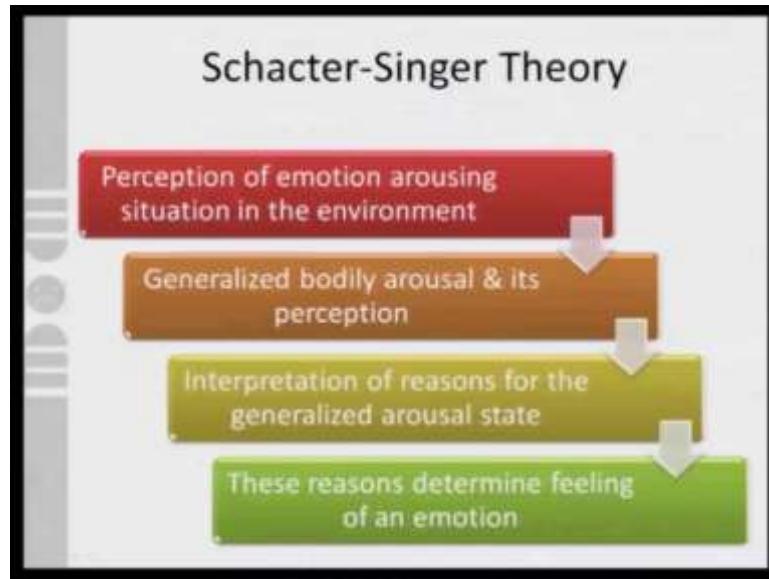


Schacter's Theory

- Cognitive Appraisal
- Perception of emotion comprises of physiological arousal as well as labeling of that emotional arousal.
- The physiological arousal provides the primary strength to perceive an emotion.

So, what this theory says is that the perception of emotion basically comprises of the physiological arousal as well as labeling of that emotional arousal. So, you experienced the psychological arousal which actually provides the primary strength to perceive an emotion, but then you try to label this. So, once you have the physiological arousal you try to assign a meaning to this very emotional arousal you try to label it.

(Refer Slide Time: 01:12)



So, according to Schacter-Singer perception of emotion arousing situation express in the environment you remember this was the first thing and it has remained common write from gemes lenzan theory two cannon bard theory. Everywhere you have the perception of emotion arousing situation in the environment. Then, this leads to the generalized bodily arousal and its perception of which is again common to the biological theories, but that the addition is that after you have the generalized bodily arousal and its perception of the bodily arousal you try to interpret and you try to interpret this bodily arousal and try to give a reason for this generalized arousal, why is it that I experience this type of a state and these reasons basically they determine the feeling of an emotion.

So, the situation is perceived, you have a bodily response, you try to understand you try to interpret, you try to give a reason to the physiological changes the bodily arousal and this state of arousal, the reason that you give that reason determines what emotion will be experienced. Therefore, it is called cognitive appraisal theory.

(Refer Slide Time: 02:39)

Schacter's Theory

- For instance, an attendant comes along with a patient to a dentist's clinic.
- He has normal breathing and heartbeat.
- He can intellectually realize the patient's fear but can not experience fear or pain.
- This is because of less arousal level.

For instance, an attendant comes along with the patient to a dentist's clinic. He has normal breathing and heart beat. Now he can intellectually realize the patient's fear, but cannot experience fear or pain.

(Refer Slide Time: 02:58)

Schacter's Theory

- Arousal devoid of emotional label inhibits perception of emotion.
- For instance, a player with high level of physiological arousal during the game perceives little or no emotion.
- This is because the arousal is primarily because of non-emotional reasons.

This is because the lower degree of arousal level. Now arousal which is devoid of emotional label, they inhibits perception of emotion. Means if you are not able to identify the arousal that has taken place you will not be able to precede the emotion. For instance a player with high level of physiological arousal during the game perceives very

little or no emotion this is because arousal is primarily because of non emotional reasons you know. So, this is in one situation you take example of dentist clinic the second situation where you take a player in the ground.

(Refer Slide Time: 03:42)

Schacter's Theory

- Physiological arousal without apparent labeling stimulates a need for cognitive labeling.
- This makes the individual move towards experiencing the emotion.

In both the situation, Schacter's Theory says that the psychological arousal without apparent labeling is stimulates a need for cognitive label and this makes the individual move towards experiencing the emotion. So, by the fault once you have the psychological arousal you will try to find the reason behind that arousal and once you find the reason behind the arousal, if you have been able to identify the reason find your performed the task of cognitive labeling their arousal and that gives the meaning.

(Refer Slide Time: 04:15)

Schacter's Theory

- Compared to other theories, this theory overwhelmingly support the significance of cognitive factors in emotional processes.
- This theory considers different emotions as diverse cognition of the same arousal.
- This is in contrast to other theories.
- Other theories have consider different physiological concomitant for diverse emotions.

Now, compared to other theories, this theory overwhelmingly support the significant of cognitive factors in emotional processes and therefore, this theory basically considers different emotions as diverse cognition of the same arousal. So, there is a change in the heartbeat, there change in the pulse rate, there is change in the response, but then although the heartbeat changes the pattern of change that has taken place according to this theory is not important, why has the pattern changed, you yourself search meaning for this yourself assign a reason for this and once you assigned the reason for this this become the source of your emotion.

So, this is in contrast to other theories because this theory basically considers that different emotion are basically a diverse cognition of the same arousal label takes place .Other theories I have considered different psychological committees for diverse emotion. So, this is the major point of distinction between the biological theories and this very a specific theory the success single theory of emotion.

(Refer Slide Time: 05:28)

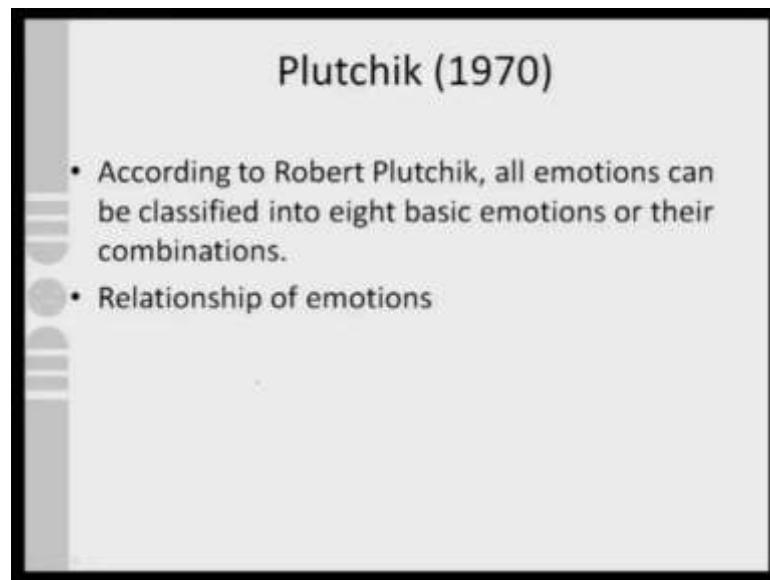
Plutchik (1970)

- According to Robert Plutchik, all emotions can be classified into eight basic emotions or their combinations.
- Relationship of emotions

Now, Lazarus you know said that emotional responses are basically outcome of internal and a situational appraisal processes and according to Lazarus there are three possible outcomes the biological urges of the individuals to respond to act the subjective affect they emotion and the psychological responses and therefore, emotions at the same time along with performing with the task of, it also induces coping activities and that is a reason why in the literature in psychology later on you will come across emotion focused coping and problems focused coping the two coping strategies that was proposed by Lazarus.

Now, that we have talk about know the biological length of cognitive theories of emotion, let us now talk about how many types of emotions are there, if I ask you how many emotions are there, I am sure you will come across a with an exhausting list of emotions psychologist have tried to find out how many basic emotions are there basic emotion would mean that these set of emotions will have a very distinct features their characteristic will not overlap with other emotions. So, if the characteristics of happiness does not overlap with the characteristics of sadness then happiness and the sadness qualifies to be two distinct basic emotions, before I come to how many basic emotions have been now finally, agreed upon in the literature in psychology.

(Refer Slide Time: 07:24)



Let us first look at the proposal given by Plutchik according to Robert Plutchik, all emotions can be classified into 8 basic emotions. But what he nicely did was that he said that all these basic emotions you can also think of their combinations and the best was that he talked about the relationship among these emotions, joy, trust, fear, surprise, sadness, disgust, anger and anticipation. These are the 8 basic emotions that Plutchik talk about.

(Refer Slide Time: 07:48)



Now, that Plutchik proposed 8 basic emotions he said that these emotions are basically multidimensional and primarily he said that on the basis of intensity similarity and polarity intensity the high the low medium.

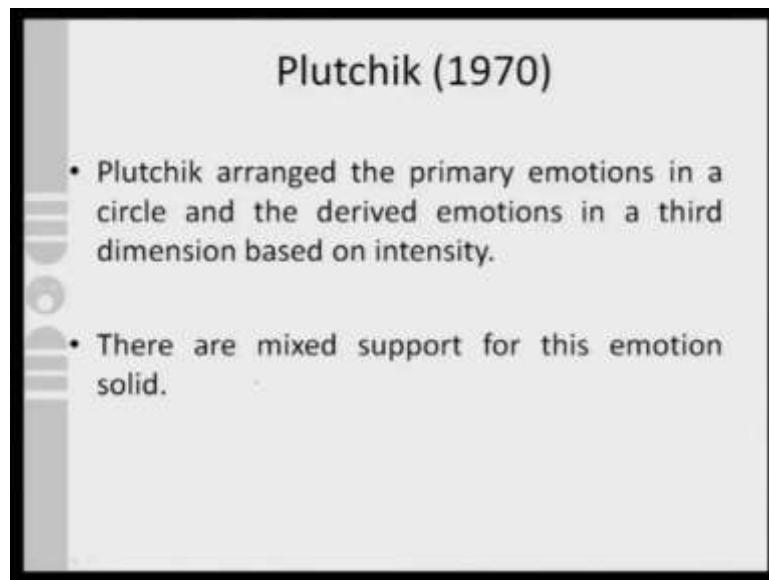
(Refer Slide Time: 08:03)

Plutchik (1970)

- These emotions are multidimensional and the dimensions are
 - Intensity
 - Similarity
 - Polarity

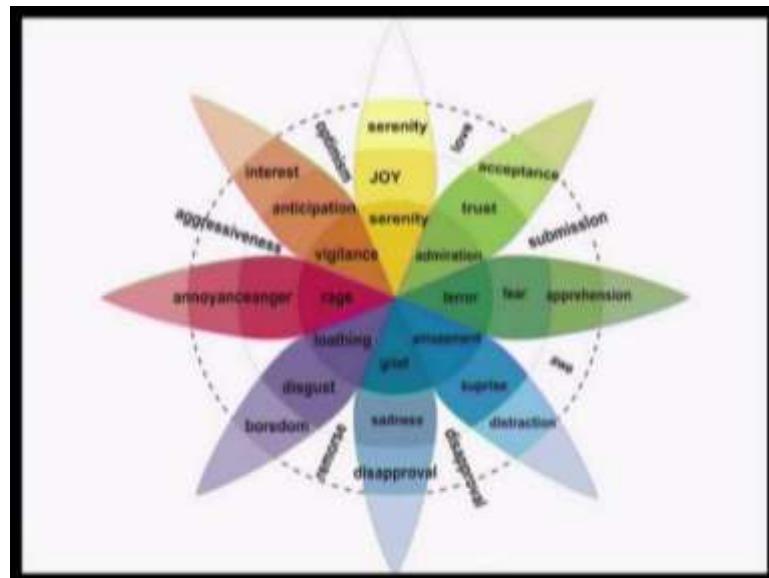
Similarity how common it is with the other one and the polarity completely on this side or completely on that side the positive or the negative Plutchik said that these three dimensions are extremely important when, you think in terms of combining these eight emotions and then trying to look at what would be the overall outcome of such types of combinations.

(Refer Slide Time: 08:47)



Now, Plutchik arranged the primary emotions in a circle and then derived emotions in a third dimension based on intensity there are mixed support for this emotion solid that Plutchik had proposed, but it is important for us to understand and we will also look at example which would substantiate what Plutchik was trying to propose.

(Refer Slide Time: 09:13)

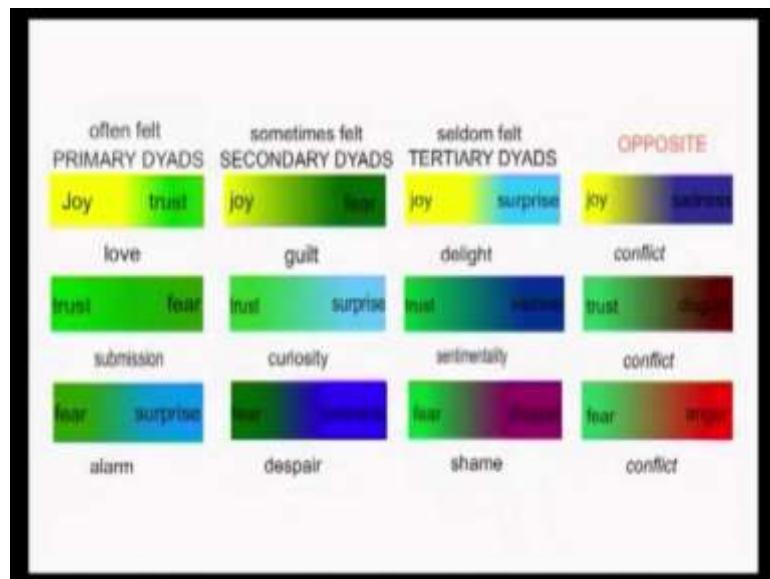


You can see the ring of 8 basic emotions write here we had just talked about them according to Plutchik the variation in intensity can give birth to another experience. For

example, fear it intensifies and then can become terror and if it loses a bit of intensity it becomes apprehension.

Similarly, added intensity converts surprise to amazement whereas, loss of intensity changes it to distraction again if you look at the other one conversions takes place in other basic emotions also sadness converts to grief and disapproval disgust to loathing and boredom anger to rage and annoyance anticipation to vigilance and interest joy to serenity and trust to admiration and acceptance according to Plutchik. These basic emotions can combine to give another sense of feelings these combinations are called dyads for example, when joy combines with anticipation optimism is born. When trust combines with fear submission evolves and so forth. we will come to them little later.

(Refer Slide Time: 10:28)



According to Plutchik joy and trust can combine to generate love trust and fear combines generate submission fear and surprise combine to generate alarm these three are primary dyads and are often felt. Now joy can combine with fear to generate guilt trust can combine with surprise to generate curiosity and fear can combines with sadness to generate despair these are secondary dyads and are sometimes felt. joy can also combine with surprise to generate delight trust with sadness to generate sentimentality and fear with disgust to generate shame these are tertiary dyads and are seldom experienced one, could think of opposite emotions combining together, but these would lead to conflicts.

Let us, now look at other primary dyads surprise and sadness combine to generate disappointment sadness and disgust combine to generate remorse disgust and anger combines to generate contempt anger and anticipation combine to generate aggression and anticipation and joy combine to generate optimism.

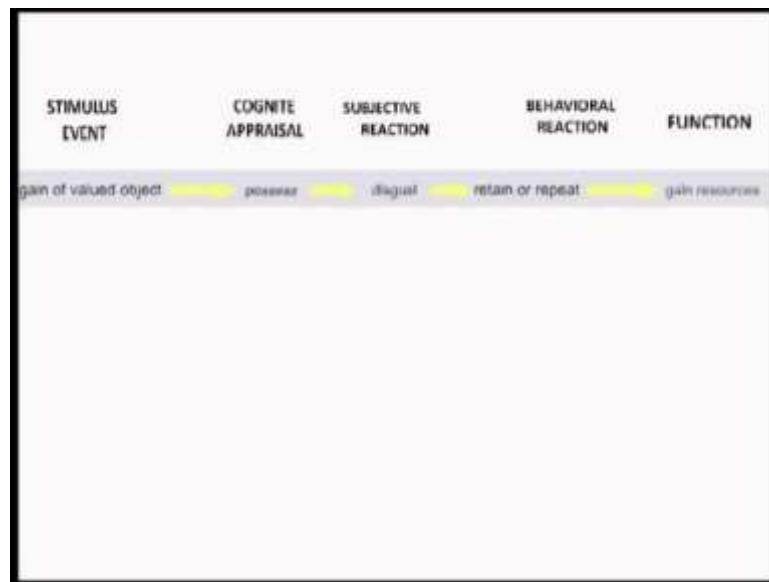
(Refer Slide Time: 11:25)



Let us now look at other secondary dyads sadness and anger combine to generate envy, disgust and anticipation combine to generate cynicism, anger and joy combine to generate pride and anticipation and trust combine to generate fatalism.

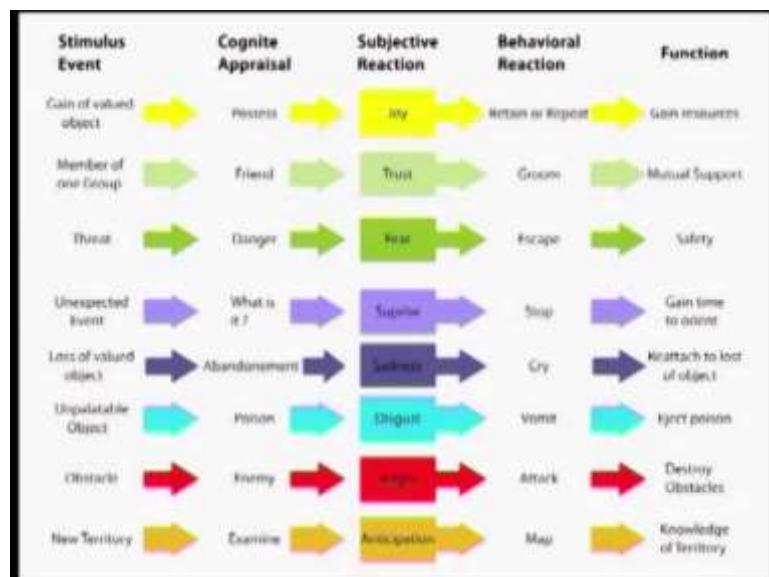
Let us now look at other tertiary dyads surprise and anger combines to generate outrage, sadness and anticipation combine to generate pessimism, disgust and joy combine to generate Morbidity, anger and trust combine to generate dominance and anticipation and fear combine to generate anxiety.

(Refer Slide Time: 12:34)



Another example of opposite emotions combining together is surprise and anticipation as you know these generates conflicts Plutchik has beautifully explained, how the whole chain of events is completed during any emotional state we have an event that provides stimulus this is cognitively appraised, this leads to some subjective reaction it is manifested in some form of behavioral reaction and finally, the function is accomplish you can see certain stimulus on the screen and see this full chain.

(Refer Slide Time: 13:01)



Now, here we are going to look at this stimulus event the cognitive appraisal the subjective reaction the behavioral reaction and the function. Now gain of valued objects is the stimulus events you have to posses it this is the cognitive appraisal you have the subjective reaction, you have the joy, you retain or repeat that is your behavioral reaction and finally, you perform a function that is you gain the resources.

Now, you are member of one group you consider yourself to be a friend this is the cognitive appraisal you have trust towards your group members this is your subjective reaction you groom your behavior accordingly that is your behavioral reaction and the function that it performs is the mutual support you support your members and your team members they support you.

Now, you have threat that is the stimulus event you cognitively appraise that you are in a situation a danger the subjective reaction is that of fear, escape is the behavioral reaction and then the function that you perform is that fine you look for safer options you look towards safety.

Now, you have an unexpected event you just think what is it this is the cognitive appraisal the subjective reaction you are surprised the behavioral reaction, you stop and then you gain time to orient yourself. This is the function that you perform you have loss of valued object you have a sense of abandonment this is your cognitive appraisal you feel sad this is your subjective reaction, you cry because of that feeling that is the behavioral reaction and then reattach to loss or object this is the function that you perform you have an unpalatable object and then the cognitive appraisal you think it could be poison you are disgusted this is the subjective reaction you vomit that is the behavioral reaction and this is how the poison gets ejected this is the function that it performs.

Now, you have an obstacle cognitively you appraise that fine he or she is my enemy the subjective reaction you feel anger the behavioral reaction you attack and this is how you destroy obstacles this is the function that it performs. So, basically when you look at these colored objects the subjective reactions you have joy trust fear surprise sadness disgust and anger and these are considered to be the emotions.

Now, you have new territory you examine them because you examine them what is a part of your cognitive appraisal you have a subjective reaction. You have and feeling of

anticipation then finally, you go for a behavioral reaction you map them and then finally, you know the territory you have the knowledge of territory this is the function. That it performs, right now we were talking about the Plutchik theory where you talk about the combination of two of the basic emotions look at this news items.

(Refer Slide Time: 16:02)



What you saw actually, till now is a son who is believing the death of his father a father was assassinated and see the expression on his face and the words that he speak primarily you will get what Plutchik was trying to say, the you can still have the combination of two of the primary emotions the second attempt to identify basic emotion was made by Izard who said there are nine innate.

(Refer Slide Time: 17:59)

Izard (1972)

- There are nine innate and unique emotions that produce the main human motivational system.
- All of them are discrete because of the facial and physical activities.

And unique emotions that produce the main human motivational system all of them are discrete because of the facial and physical activities.

(Refer Slide Time: 18:11)



According to Izard interest enjoyment surprise distress disgust anger shame fear and contempt these are the 9 basic emotions. I repeat it once again he said that we have interest enjoyment surprise distress disgust anger shame fear and contempt and these are the nine basic emotions.

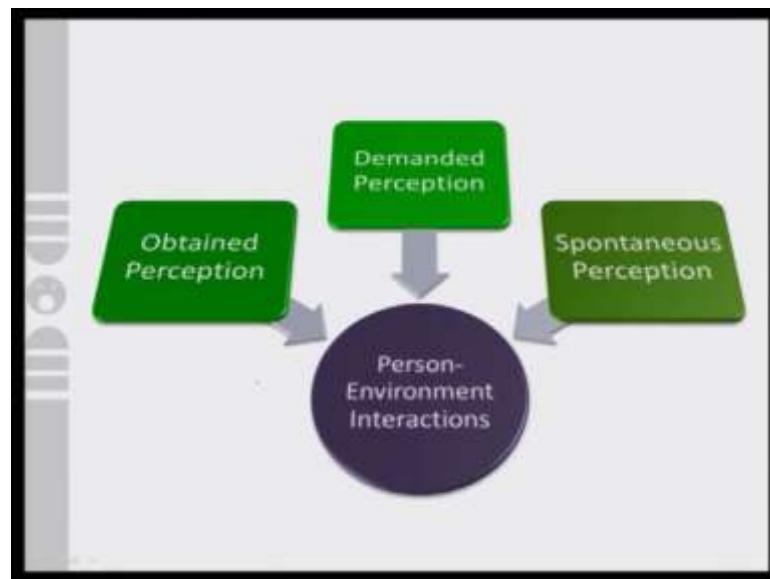
(Refer Slide Time: 18:33)

Izard (1972)

- Emotion is activated by three person-environment interactions and five intra-individual processes.

According to Izard emotion is activated by three person environment interactions and five types of intra individual processes.

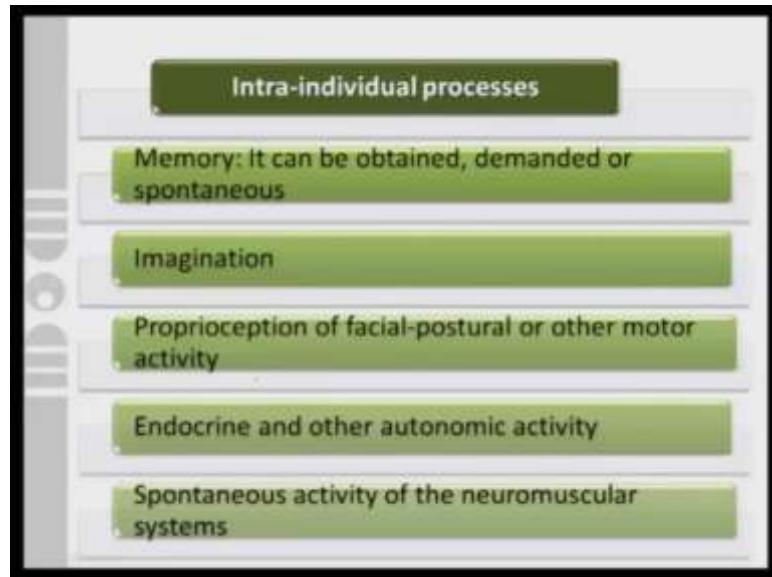
(Refer Slide Time: 18:42)



So, you have the person environment interactions and then obtained perception the demanded perception and the spontaneous perception. So, you can now very easily relate what we discussed in our first module. Where we are talking about the process of sensation and perception the whole thing of assigning meaning to the stimulus that you perceive in the environment that is presented in the environment. How you go for and in-

depth analysis how that perception induces certain bodily changes within you and how that bodily change you try to assign the meaning to it which also in turn facilities the person environment interaction.

(Refer Slide Time: 19:37)



Now, the 5 different known intra individual process that Izard talked about were memory, imagination, proprioception, the activities of the endocrine and other autonomic activities, and spontaneous activity of the neuromuscular systems. So, he said that memory which can either be obtained, it could be demanded or it could be spontaneous, plays an important role in our interaction. How you imagine things, the proprioception of facial postural or other motor activities.

How much is the functioning and activation of the endocrine and other autonomic functions and then, how spontaneously the neuromuscular system they respond and these factors also would help you have this type of interaction which in turn will try to produce certain type of motivational state. So, basically what Izard said was that we have innate emotional states and the unique of this emotions basically produce the motivational systems also and then, said that the physical activities and the facial activities they are discrete, but basically emotional and motivational states he was trying to propose that they overlap. The reason why we took Izard here was that Plutchik has said that there are eight basic emotions. Izard says that there are nine basic emotions.

(Refer Slide Time: 21:22)

Paul Ekman

- Performed cross-cultural research (facial expressions) on the Dani and Fore tribesmen (isolated, stone age culture) of Papua New Guinea.
- He concluded that the facial expression of some basic emotions is innate.

And then came, the proposition by Paul Ekman. Ekman performed cross cultural research on the Dani and fore tribesmen of Papua New Guinea then, he concluded that there are some basic expressions which are very, very innate.

(Refer Slide Time: 21:36)



And according to Paul Ekman, we just have six basic emotions happiness sadness anger fear disgust and surprise just 6 basic emotions rest all are combination of these emotions.

(Refer Slide Time: 21:53)

Basic Emotions

- Fundamental characteristic that are different from other emotions.
- Specific antecedent events bringing about a given emotion in everybody.
- For example, goal obstruction generates anger.
- This is true for everybody.

Now, basic emotions basically their fundamental characteristics are different. So, happiness, sadness, disgust, fear, anger, surprise, none of these emotions, their fundamental characteristic will overlap and therefore, specific antecedent events will bring these the emotions of and accordingly the bodily changes, that you see in these emotions might psychologically show you certain type of a pattern, but then in terms of subjective experience they are unique.

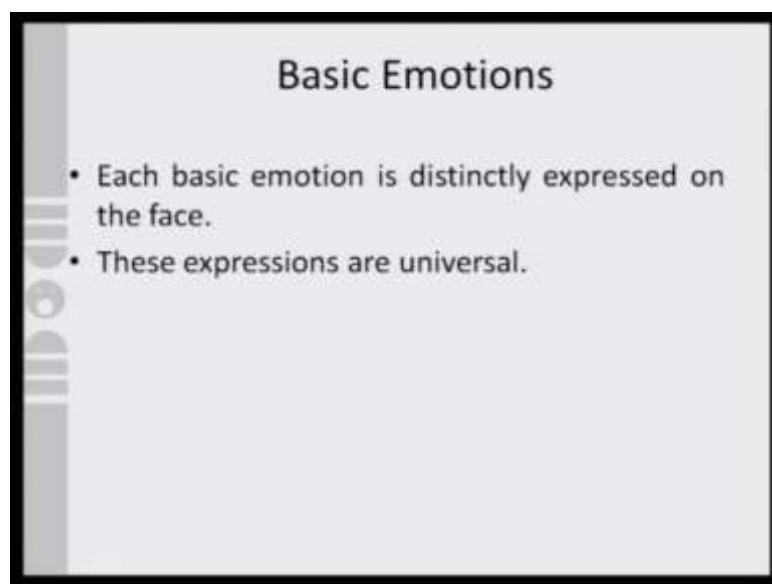
Key words - schacter's theory, Plutchik, basic emotions, dyads, Izard, Paul ekman

Introduction to Psychology
Prof. Braj Bhushan
Department of Humanities and Social Sciences
Indian Institute of Technology, Kanpur

Lecture - 25
Emotions - Basic Emotions

Now that we have discussed basic emotions, let us understand things from two three prospective.

(Refer Slide Time: 00:30)



The slide has a dark grey header bar. The title 'Basic Emotions' is centered in a white font. Below the title is a bulleted list in a white font:

- Each basic emotion is distinctly expressed on the face.
- These expressions are universal.

One, we now know that each basic emotion is distinctly expressed on the face and we also know that because these are basic emotions there. So, there is the possibility of many of these emotions to be considered as universal expressions. Universal expression would mean that irrespective of the culture, the facial expression would by and large remain the same.

So, these six basic emotions which we finally arrived at towards the end of our second lecture; happiness, sadness, fear, anger, surprise, and disgust; these six basic emotions - the facial expressions that represent these emotions they remain the same across the culture. So, if there is universality of expression how do we learn it? Is it that we are biologically programmed to express these emotions. How does this happen?

(Refer Slide Time: 01:29)



Let us now understand how a human infant learns to express through face.

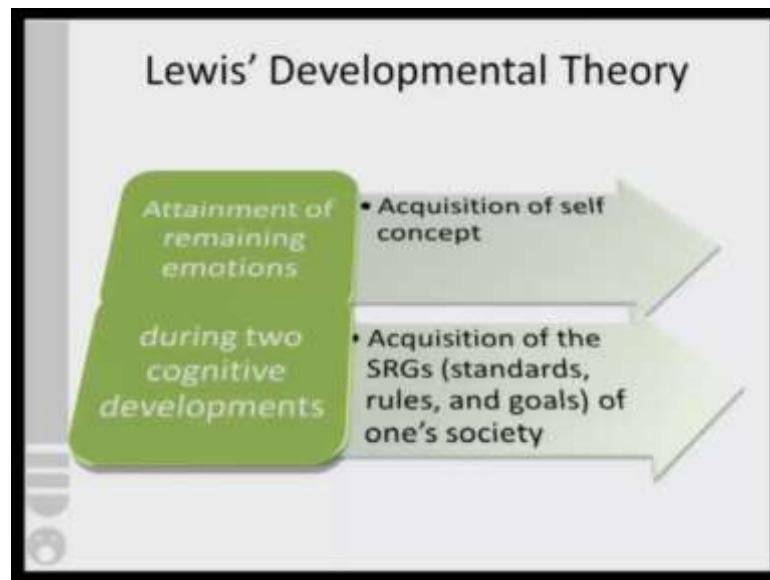
(Refer Slide Time: 02:28)

Emotions in Infants

- Michael Lewis' developmental theory (1993) suggest that infants are endowed with the inborn cognitive capacity to have a subset of emotions such as joy, sadness, fear, anger, surprise and disgust.

Levis proposed a developmental theory suggesting that infants are basically endowed with the inbound cognitive capacity to have a subset of emotions such as joy, sadness, fear, anger, surprise and disgust. So, six basic emotions that we were referring to Lewis' developmental theory say that fine human infants they already have this inbound cognitive capacity. So, what happens?

(Refer Slide Time: 02:56)



Now, this theory further says that to attain the remaining emotions which happen during two cognitive developments. First one acquires self concept, who am I that is the acquisition of the self concept. And two acquisitions of standard rules and goals of the society in which the individual is living, is growing up. So, these standard rules and goals are called SRGs. Lewis' developmental theory says that we acquire one our concept of the self who am I. And two after I acquire who am I, I also acquire the standard rules and goals of my society.

So, that would mean that after acquiring the concept of the self I also understand what my society expects out of me.

(Refer Slide Time: 04:01)

Lewis' Developmental Theory

- For example, emotions such as envy, empathy, embarrassment, pride, and shame can not be experienced without realizing one's own position with respect to others.
- This implies that the two fold cognitive developments are not needed for experiencing and expressing the basic emotions.

For example, if you think of emotions like envy, you are jealous of someone, empathy, embarrassment, pride, shame. Now, these emotions cannot be experienced if you do not do not realise your position with respect to others. So, unless I experience who am I, I acquire this very ability I understand who I am, I cannot be jealous of somebody else. Because, self and the non self the other self these two things I will have to first establish within me and once I establish this within me then only I can have the sense of envy, I can develop jealousy.

If I have a sense of pride, then also I need to understand my position in my society. And then I understand that fine whatever I have acquired is something that the society would really appreciate and this would fill me with the sense of pride. Now this implies that the two full cognitive developments are not needed for experiencing and expressing basic emotions.

Now, basic emotions the surface before achievement of the self consciousness and certain other type of emotions such as embarrassment envy and empathy they may emerge before the integration of the moral system. So, this is an interesting explanation of how infants they develop how to express themselves.

(Refer Slide Time: 05:32)

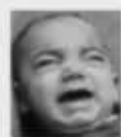
Facial Expressions in Infants

- It is intricate to draw discrete negative expressions from a crying bout of the infants.
- The infants tend to cry in all negative situations. A close look at the crying face illustrates interesting patterns.

Now, it is intricate to draw the discrete negative expression from certain expression of the child especially, say if you are looking and the crying bout of an infant and if you want to demarcate which expression this is it is very difficult. Now infants usually have been found to cry in all negative situations, but when you look at their facial expression while they cry you will come across a very interesting pattern.

(Refer Slide Time: 06:01)

Facial Expressions in Infants



Lowering of the eyebrows, corner of the lips pulled to a side, opening of mouth and raising of cheek

The crying face has a mixed feature of anger and distress both

Now, look at this very expression what you see is lowering of the eyebrows, corners of the lips which gets pulled to a side and opening of mouth and of course this leads to raising of the cheek. Now crying face has a mixed feature of anger and distress.

Anger in adults we will consider this to be a basic emotion. Similarly disgust will have a different expression. Here distress and anger both of them they mix up although the child is trying to express the negative feeling.

(Refer Slide Time: 06:38)



Now, depending on certain situations the child might come forward with different sets of expressions. You start looking from the bottom the expression represents weak cry, then the moderate cry, another form of moderate cry and then finally the strong cry.

(Refer Slide Time: 07:00)

Facial Expressions in Infants



Muscle contraction near eye and upward lifting of cheeks

Ekman (1994) has made a distinction between joyful and non-joyful smiling

Similarly, you can have expression of happiness, where muscle contraction takes place near the eyes and there is an upward lifting of the cheek. Very interestingly Ekman has made a very interesting distinction between the joyful and the non joyful smile. So, it is not that if you smile you are happy there could be non happiness induced smile. So, that is distinction that Ekman has made.

(Refer Slide Time: 07:34)

Facial Expressions in Infants

	Very strong smile, Open mouth	
	Minimal smile, Open mouth	
	Strong smile, Closed mouth	
	Strong smile, Closed mouth	

- Messinger, Fogel & Dickson (2001)

Now, again the way we were looking at crying look at smile. Right from very strong smile to minimal smile, again strong smile another format of a strong smile and you

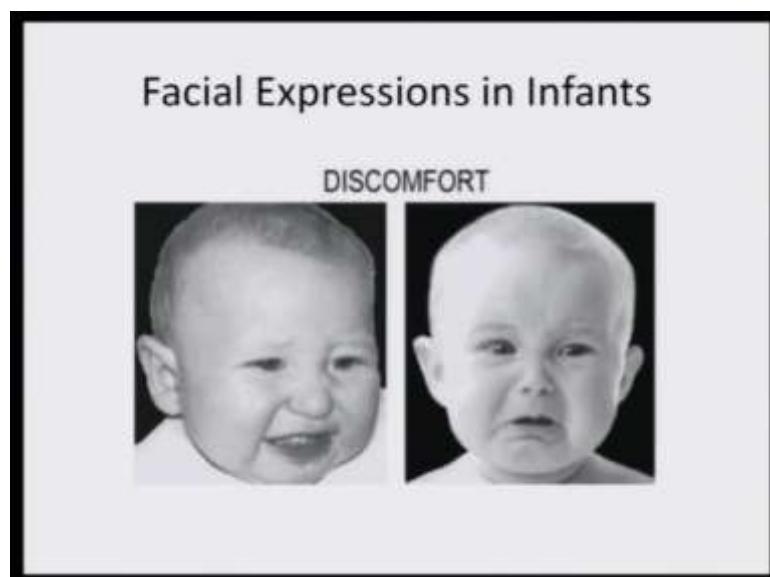
realise that the expressions are very very different. So, drawing a common line of distinction is extremely difficult, if you look at their expressions of the infants.

(Refer Slide Time: 07:54)



Now, look at distress both these images they represent distress were as you can understand that the facial expression is not exactly the same.

(Refer Slide Time: 08:08)



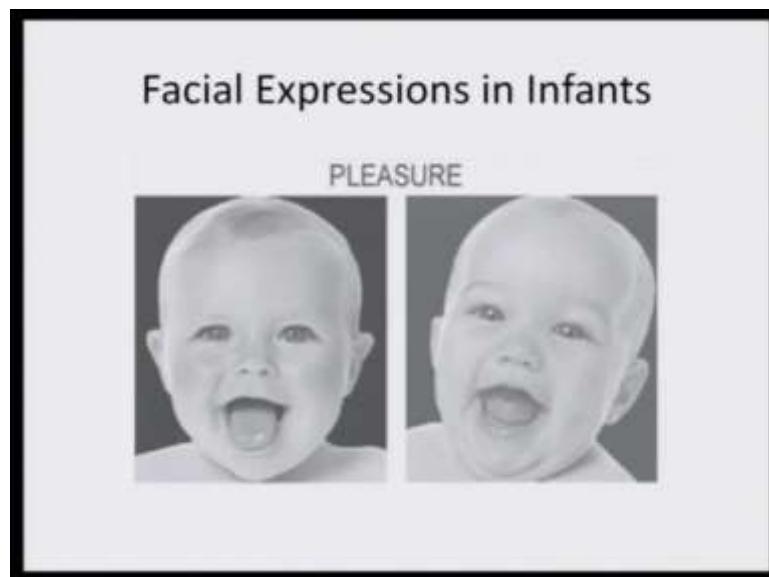
Discomfort for instance.

(Refer Slide Time: 08:13)



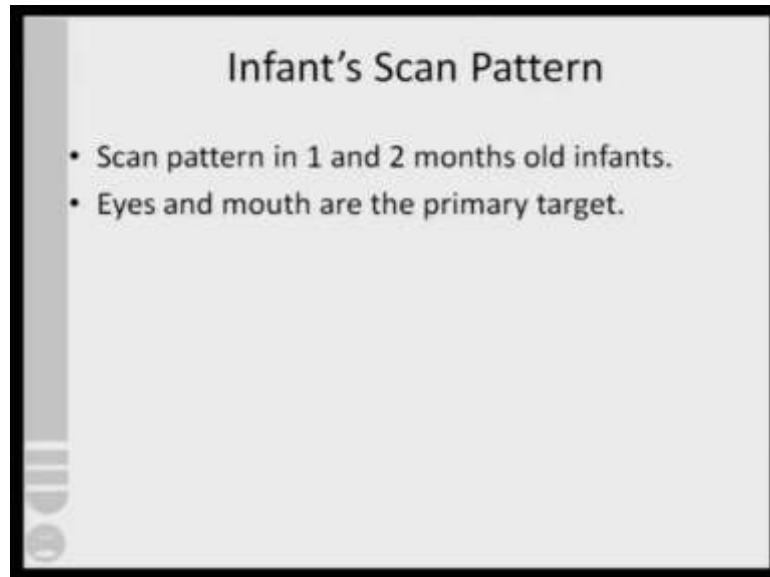
Comfort for instance.

(Refer Slide Time: 08:16)



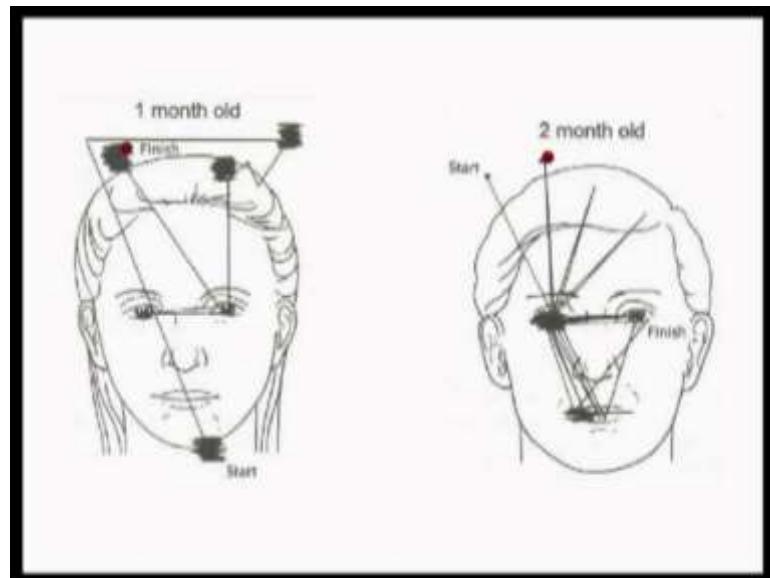
And now see pleasure. There is whole lot of difference if you look at the expressions of human infants. Because a growing child an infant will have a very very close interaction with the mother; so how does the child understand the expression of the mother? Right now what we were doing is that we were looking at the expressions of the infant. Now we are trying to say although this human baby is in the state of infancy how does he or she understand the expression of his or her mother.

(Refer Slide Time: 09:03)



It has to realise that eyes and mouth these are the two primary locations where the children 1 to 2 month old infants they focus when they look at their mothers. And of course, when they look at their fathers also they look at only these two areas in the face eyes and the mouth. Look at this video.

(Refer Slide Time: 09:18)



Now look here the 1 month old child is looking at the mothers face and then you see right from the start point how the eye fixation changes and finally goes and sticks at some point. In the other image you will see at 2 month old child looking at the father and

then you see right from the start point how the fixation points changes and finally it is stops somewhere. Now, this is how the infants they look at their parents.

(Refer Slide Time: 09:45)



Bridges proposed that the newly-born human babies they have undifferentiated human emotional expressions which with what you call passage of time gets further differentiated.

(Refer Slide Time: 10:05)



So, according to bridges model at the time of birth child has nothing but only general level of excitement which by the end of second or third month converts into distress and

delight. And this further by the end of the 6 month the child learns how to express anger, disgust and fear which basically is further expansion from the expression of distress.

Now let us understand how emotion and memory they work in the case of children. Before starting our discussion on emotion, we did talk about memory and there also we said that personal significant plays a very important role. Now that emotion which is likely to have more of a personal significance, so how emotion and memory both will work together in the case of human children.

(Refer Slide Time: 10:56)

Between 18-36 months	Use of emotional words in their conversation
3 Years	Identification of emotions and situations provoking them
4 Years	Accurate matching of basic emotions (happy, mad, sad, and surprised) with the correct corresponding facial expressions
6 Years	Children adept to interpreting emotions at 3 years continue to be better

Now, between the age of 18 to 36 months children they use emotional words in their conversations. By the time they are 3 years old they can identify emotions and situations that provoke emotions. In the fourth year they can accurately match the basic emotions with the correct corresponding facial expression. And by the time they are 6 years old they adapt to interpreting these emotional expressions.

(Refer Slide Time: 11:25)

Emotion & Memory in Children

- Emotional memories mostly involve the attainment (happiness) or blocking (sadness, anger) of personal goals in children as well as adults.

Now, emotional memories mostly involve the attainment and blocking of personal goals in children as well as in adults. You remember Zeigarnik effect that we talk about in memory and explanation that Kanungo had given that it is a basically the pleasant and the unpleasant experience which will help you recollect your events, the memory of the event rather than whether you are able to complete it or it was not completed. It is similar to this type of explanation which says that you have at fixed certain goals for yourself whether you are a child or you are an adult.

What is the degree of happiness, how delighted you are when you attain the goal, or how sad or angry you become when the goal that you are trying to achieve is blocked. So, it is the attainment or the blockage. You are moving towards the personal goal that becomes extremely important. And therefore when you start recollecting things from your experience the emotion driven memory would largely have either the issues related to attainment or episodes related to blockage of the personal goals.

(Refer Slide Time: 12:53)

Emotion & Memory in Children

- Children have a better recall of emotional behaviour as compared to emotional labels and non-emotional behaviours.
- For example, memory of an outing with the parents, receiving a gift from the father, and so on.

Children of course they have a better recall of emotional behaviour as compared to emotional labels and non emotional behaviours. For examples the memory for receiving a gift from one of the parents will be better if you have gone for an outing somewhere you will have a better recall of that very event. So, emotional behaviour will always have a better recalling in case of children compared to when you simply use the word that labels of the emotion or if you compare between recollection of non emotional behaviour versus emotional behaviour children by default will always have a better recall of emotional behaviour.

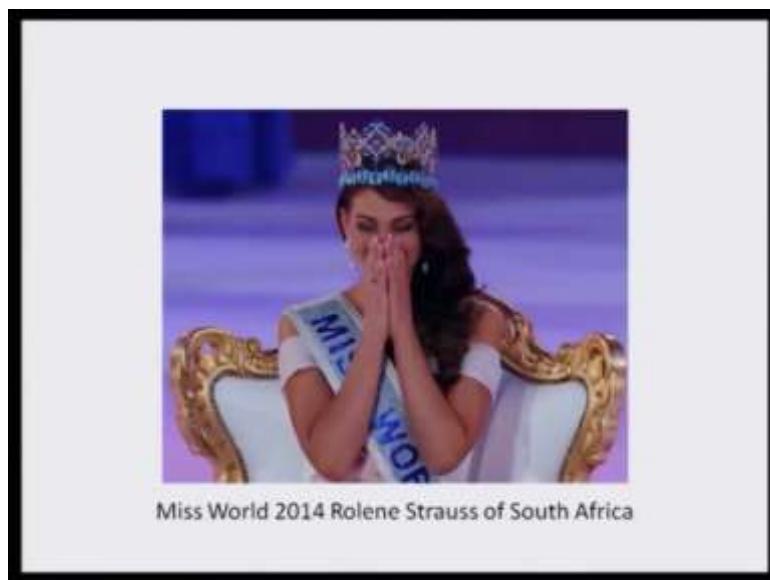
Now what we have discussed till now is that as an infant you grow, as an infant you are endowed with certain capacity to acquire certain emotional expressions, you also look at your parents, you learn how to express yourself, but is it that entire facial expression is only what you call parent centric or is it that there is an influence even of the society. Of course, we have talked about acquisition of SRG's. But besides SRG's say for instance if you learn how to express anger, expression of anger is one aspect how much to be angry, how to express it. Is it that we differ or is it that we have a source from where learn or is it that we are biologically endowed with that capability? Look at this very ad it of course an ad of a product, but we are looking at how human children they imitate, look at this ad.

What did you see in this very video? First, the father shouted at the child and the child reverted back exactly the way the father had expressed his anger. The reason I picked up this very ad was the expression that the child has learnt to show is exactly the same that he had learnt from his father. So, there is the strong possibility that the way human children they express themselves might be guided by the source, the model whom he or she is trying to imitate from the environment.

The other example would be when you look at the beauty contest, where you see that all the winners unequivocally they would express same way look at this very video. This is the expression of feelings when Sushmitha Sen won Miss Universe in 1994. You must have watched many female winners expressing their emotions the same way and this actually represents that how that culture actually influences your expression of emotion.

You saw Sushmitha Sen no, finally what she did was she just tried to hide her part of the face using her hands and this was basically joy of an ultimate order. Now is it that few models express themselves like that because Sushmitha Sen's episodes took place long back. I was searching for the beauty contest winners how they express themselves.

(Refer Slide Time: 17:01)



Look at one of the recent expressions where Miss World 2014 who is from South Africa when she won the medal how did she express herself. It matches the way Sushmitha Sen was expressing herself.

(Refer Slide Time: 17:11)



Now, let us go little back 2012 Miss World winner, who was from China. Now you have noticed from India, China, South Africa all of them expressing themselves the same way. So, this is a strong indicator the way we saw in the case of ad where the son was imitating expressing the way the father expressed, here you find that irrespective of the event and irrespective of the cultural background people in one given profession they express themselves in the same way. So, this is indeed very interesting.

Now this shows two things. One, the fact that we acquired certain rule certain guide lines from our environment that is what is Lewis' Development Theory. Second irrespective of our culture it is the people around us from whom we learnt through the process of imitation. Imitation we had discussed when we were talking about learning that we select role models and we then we imitate our models. The child in the ad actually imitated the father, but in the process of imitation he also learnt how to express his anger and disgust.

Second case irrespective of the cultural background from where you are might be that you have seen that largely the winners in one situation in one profession they express themselves the same way. So, every time when you win Miss World competition irrespective of the cultural background, irrespective of the difference in the SRG that Lewis was talking about we express ourselves the same way.

So, this shows that how human beings right from the state of infancy till when they grow up and then they move ahead in the profession how they learn to express themselves. So,

we will end our third lecture here. In the next lecture we will be talking about specifically the influence of the culture on emotional expression.

Key words - basic emotions, Lewis, developmental theory, facial expressions in infants, emotion and memory in infants

Introduction to Psychology
Prof. Braj Bhushan
Department of Humanities and Social Sciences
Indian Institute of Technology, Kanpur

Lecture – 26
Emotion - Culture and Emotion

Now, let us talk about the influence of the, impact of the, effect of culture on emotional expression. I will like to begin with an interesting experiment of a prism.

(Refer slide Time: 00:32)

Culture & Emotion

- Friesen (1972): Participants had to view a stressful film alone and with the experimenter.
- Pan-cultural facial signals were observed during spontaneous expression of emotions in isolated condition (viewing the film alone).
- Culture-specific expressions were observed in social reciprocation condition (viewing the film with the experimenter).

What interestingly this experiment wanted was that the participants, they had to view a film which was extremely stressful and there were two conditions, either you view the film all alone or you view the film with the experimental, two situations. What was finally, observed now the pan cultural facial signals they were observed during this spontaneous expression of emotion, when the participants they were viewing the film all alone. And cultural specific expression was observed in social reciprocation condition, that is when the individual, the participant was viewing the film with experiment; that means that when you have people from your own cultural background around you, your face largely reflects the cultural specific expressions and when you are all alone it is pan culturic expression that you show through your face.

So, this is an interesting distinction, that means, again go back to learning where we said, know there is something called social facilitation. You behave little differently, when you

are in a group. So, when you are in a group of people who share your culture, then you show now heightened degree of culture specific singles on your face. This was an interesting experiment. Now the expression of happiness is largely encouraged in collectivist culture compared to individualistic culture, where in the case of individualistic culture the expression of personal feelings you can very conveniently express it whereas collectivist culture they would demand that you should largely express the positive emotions on your face.

(Refer slide Time: 01:59)

Culture & Emotion

- The expression of happiness is encouraged at the cost of expression of sadness in individualist societies, whereas collectivist societies cherish the reverse.

Individualistic culture you can very happily know represent your sadness in a given situation, but collectivist culture will have by and large will encourage you to now mask your sadness, to neutralize your sadness, one of these two conditions and if you can of course cover it up with certain degree of happiness that could be the best. Look at your early morning interaction with people around you, in our culture India when you ask somebody, How are you? The standard reply is fine. Very few people say good. Most of us say fine. So, the good days extended to the heightened degree that is what we express. Whereas, in several individualistic societies you would realize that many people, when you ask them, how are you? They would largely say not so bad; not so bad is an expression that you would never ever see in this culture.

So, that is the big difference, that is what you call the encouragement that you unknowingly acquire which actually is a part of the social influence, the cultural influence.

(Refer slide Time: 03:51)

Culture & Emotion

- Less public expression of negative emotions in collectivistic societies.
- On the other hand, individualistic societies (such as North America), 'may sanction the communication of these emotions more, as they relate to individual freedom to express and perceive negative emotions'.

- Matsumoto (1989, p. 101)

Several studies have demonstrated that very little negative emotions are publicly expressed in collectivist society. Whereas, in the case of individualistic society, I am quoting Matsumoto who says that individualistic societies may sanction the communication of these emotions more. As they relate to individual freedom to express and perceive negative emotions.

(Refer slide Time: 04:21)

Culture & Emotion

- In collectivistic society people forgo negative emotions in order to support group standards.

Now, in collectivistic society people forgo negative emotions in order to support group standards. Everybody says I am good, I am fine and you want to know somewhere come closure to that type of the standard, that the group is maintaining and therefore, wherever you ask in the morning, Good morning. How are you? and you say good or you say fine. We are going through the brief introductory psychology course and therefore we will not go in to the details of studies on the effect of culture on emotion, but I must just refer to it. You need not go into the details of it.

(Refer slide Time: 05:11)

Culture & Emotion

- “Facial expressions of emotions are governed both by mechanisms associated with facial side (neuro) and by learned display rules (cultural)”

- Mandal, Harizuka, Bhushan, & Mishra (2001, p. 395)

That, there is a theory called a Neuro cultural theory of emotion which basically says that the facial expression of emotion will have mechanisms which are associated with side of the face. The expression which is neuraly governed and the display rules that you learned from the culture.

So, what happens? We have the two sides of the face. The left and right side and neuraly, there are two mechanisms. One what is call as the Contra lateral mechanism. You remember in the case of sensation we talked about, when we were looking at the visual process that at optic chasm, the neural fibers they criss-cross. So, from the left eye they go to right lateral geniculate nucleus and then to the right side of the brain. So, contra lateral mechanism would mean that from the left side, the information goes to the right hemisphere of the brain and from the right side, the information goes to the left hemisphere of the brain that is contra lateral. There is also certain type of interations what is called as Ipsilateral. Ipsilateral means from the right side of the face, the information goes to the right hemisphere. So, this is going to the same side therefore, it is called Ipsilateral.

Now, we have contra lateral as well as ipsilateral control for our facial expression, as far as the neural connections go, but there are also display rules which are cultural specific and we learned them and therefore the neuro-cultural theory says that there is what you call neural program which governs your expression, but there is also something called cultural conduct rule, the display rules that we also follow.

(Refer slide Time: 06:56)

Culture & Emotion

- Elfenbein and Ambady (2002, 2003)- Although, the recognition rate was reasonably stable across countries, the recognition of the six basic emotions was easier for the own ethnic group compared to others.

Another interesting study which suggest now that the 6 basic emotions that we have talked ,about they are much easier to understand, if you are looking at the expressions from your own ethnic group, so if I am from given group if I look at the expressions of the people from my own group, I can recognize the basic emotions very clearly, but if I look at the expressions of people from alien background, from a different cultural background then I might commit error.

(Refer slide Time: 07:40)

Culture & Emotion

- The ecocultural framework of Berry (1976) and his colleagues (Berry, Poortinga, Segall, & Dasen, 2002) talk of three kinds of antecedental influences-
 - ecological indices
 - sociopolitical indices
 - aggregated psychological characteristics

Now, if the eco cultural frame works of Berry and his colleagues, they talked about three types of antecedental influences on emotion. The ecological indices, the sociopolitical indices and the aggregated psychological characteristics now, you can see know you have the ecological components coming into being; you have the socio political component coming into being as well as the psychological characteristics. So that means, that the emotional expressions that we give in our day to day life is not a pure psychological phenomena rather it does take into account the ecological suitability of the expression it does take into account the social conduct, the display rules and all these things combined together.

(Refer slide Time: 08:25)

Culture & Emotion

- Matsumoto (1989) extended this theory from expression to the perception of emotions.
- According to him, across cultures people perceive emotional expressions in the same way. However, they acknowledge this (or do not do so) based on the culture-specific norms.

Now, Matsumoto he extended this theory from expression to the perception of emotions and he says that across culture people perceive emotional expressions in the same way. However they acknowledge this based on the culture specific norms. So that would mean that in terms of perception of emotion, we are not different across culture, but when it comes to acknowledge it, whether I should recognize this or I should try to avoid it. So, that acknowledgement would be now cultural specific in nature. The cultural norms will decide whether you should be expressing this or you should not be doing so. For example, studies approve that the Japanese they usually mask their negative emotions with smiling. So, you keep a neutral expression on the face and if at all you have to express negativity, say for example, if you have to show sadness you try to mask your expression with a certain degree of smile. Whereas, in the case of oriental Indians it has

been realized that we de-intensify the negative emotions. So, fear and anger they are de-intensified you reduce the intensity of these emotions. Why is it essential for the Japanese to mask the emotion? Why is it essential for the oriental Indians to reduce the intensity of the negative emotions? Again it is the cultural specific norms. This is not known Matsumoto was saying, when he said that even though we are all by a large the same way then it comes to perception of the emotional expression, but having perceived it, it is not a guarantee that you would also acknowledge it. So, consciously we acknowledge it only based on cultural specific norms. It is very interesting to see that to understand the nuances of facial expression; psychologies have taken various factors into account. For instance people have looked at culture, right now we also focused exclusively on culture.

(Refer slide Time: 10:49)

Facial expression of emotion

- To understand nuances of facial expressions, psychologists have taken various factors into account such as
 - culture (Western, non-Western)
 - type of participants (literate, preliterate)
 - type of expression (posed, spontaneous)
 - stimulus type (static, videotaped)
 - response format (matching/ labeling task)

So, comparing facial expressions of people from the western world versus people from the non western world or types of participants, literate versus preliterate - somebody who is educated; somebody who is not so or types of expression, either it is a posed emotion. I stand still in the front of a camera and then I put smile on my face, I show certain expression happiness, sadness whatever it is, but I pose for the photo session that is posed expression. Comparing this with spontaneous emotion, spontaneous would be that I am in a real life situation, where I express the emotion and I am clicked at that point of time it is the spontaneous expression.

(Refer slide Time: 11:30)

Facial expression of emotion

- To understand nuances of facial expressions, psychologists have taken various factors into account such as
 - culture (Western, non-Western)
 - type of participants (literate, preliterate)
 - type of expression (posed, spontaneous)
 - stimulus type (static, videotaped)
 - response format (matching/ labeling task)

You also have now the stimulus type variation - Static versus Videotaped type of an expression. Still image versus know strip of images, which primarily you can play in the sequence. So, it will have a start point and it will have the maximum intensity point before it comes to the neutral point.

So, say for example, if I have to express happiness, so from the neutral stage my facial expression goes up to certain level of happiness and again it comes down. That would be the videotaped stimulus tape and then the response format where either you ask the respondents, the participant in the study to level the emotion. Level the emotion means I show you the images and then I ask you what this emotional expression is, you have to identify the emotion. So, let us now say for example, you look at the image and say this is a happy face. So, you have labeled the emotion. The second situation could be where you go for a matching task I give you a different individuals photograph expressing one emotion and then I show you some other individuals face, having the same emotion or a different emotion and I ask you to match it and I look at how accurately you can match the expression that was the base line versus the expression that you are seeing right now.

(Refer slide Time: 13:11)

Facial Asymmetry

- The two sides of the human face are not equally pronounced during emotional expressions.
- Emotions are expressed more intensely on the left side of the face.

All these factors had been taken into account in terms of studying human expression. What studies have also found is that the two sides of the human face, they are not actually equally pronounced when we express ourselves. Emotions that are expressed are you know intense on one side of the face. And largely it has been found that emotions are expressed more intensely on the left side of the face. So, say for instance this is my left side of the face. So, this side of the face this half of the face, would be form dominant in expression compare to the right side of the face. People also talk about the social face versus the personal face. So, one half of our face is largely suppose to reflect the social protocol, the socially desired response whereas, the other half is considered to be our personal face which actually reflects the inner feeling .

(Refer slide Time: 14:09)

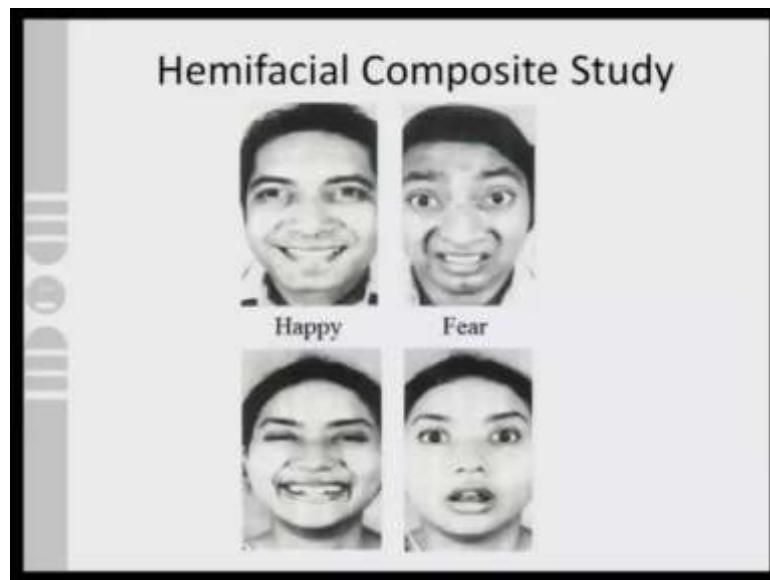
Facial Asymmetry

- Socially appropriate cues are apparent on the right side of the face, whereas personalized feelings are visible on the left side of the face.
- Right hemisphere deals with emotional processing whereas the left controls these processes in terms of social appropriateness.

So, socially appropriate cues, they are more apparent on the right side of the face, the left side of the face will have more and more of the personalized feeling. So, say if I am inwardly very happy, my left face will show pronounced happiness compared to my right face and say if I am in a situation where I have to show happiness, whereas internally I am not my right face will have that very degree of happiness, whereas my left face will not have that pronounced degree of happiness. Take an example, you are moving in a corridor and you meet couple of friends, right now we took the example that somebody ask you how are you and you say fine, culturally drawn norm. You meet somebody you say good morning and you say nice meeting you.

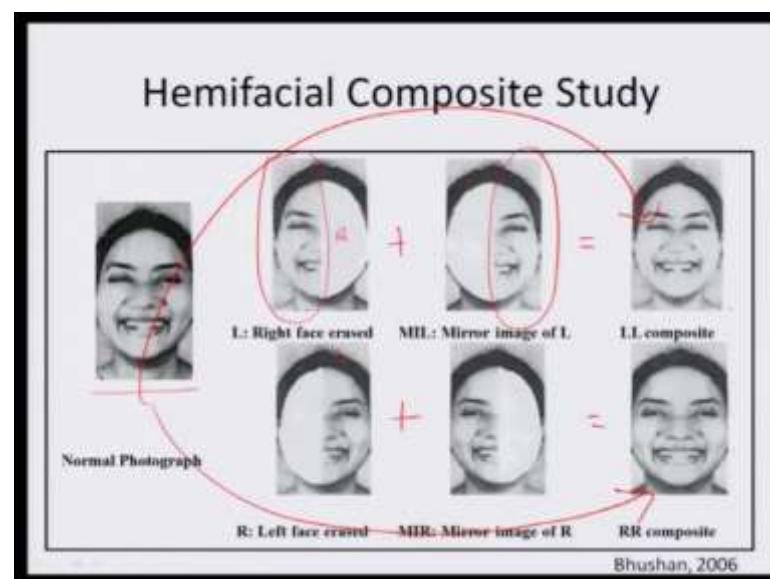
Now, you are socially supposed to meet the individual, greet the individual and say that it was a pleasure meeting you, whereas inwardly it is a great sense of discomfort for you or it might not be a great source of discomfort, but you are not so comfortable, not so happy there would be a clear distinction on the now two sides of the faces.

(Refer slide Time: 15:34)



Look at these two expressions. The happy face and the face depicting fear, what you are right now looking at is the normal configuration. Now it is if I tell you that the two sides of the face is not. Now what you call equally representative of the emotion, perhaps you will not rely in it. I am looking at the lady right now, who expresses happiness and then I will show you how the two sides of the faces are not the same.

(Refer slide Time: 16:09)



Now, you see this is the face that you saw, what I have done here is that the right side of the face, this is the right side of the face, this is erased. This is the mirror image, so this

face, this half, this is the Mirror image and these two things so this plus this has led to this face and this is basically the left-left composite. So, only the left side of the face and the reverse has been done here. So, here you have the right-right face. So, this is the left face, this is the left face, this is the mirror image of the left. So, this plus this and this is the result and then you see now the difference. Now this expression and this expression, these two faces although it has come out of the same thing. These two have come from the same photograph. You see the left-left and the right-right is not same. This means that the left face and the right face of this very lady were not expressing happiness to the equal degree, the magnitude was not the same.

So, this is what I was trying to say that the two sides of the face have also been found to represent two different you know level of intensity of emotion. Now that we have understood the significance of the face, Buck in 1918 propose the facial feedback hypothesis. This hypothesis basically proposes that the feedback that is received from the muscle they play a significant role in the subjective experience of emotion. So, how the muscles of the face contract or rarefact. So, that feedback is extremely helpful in terms of understanding and experiencing the emotion.

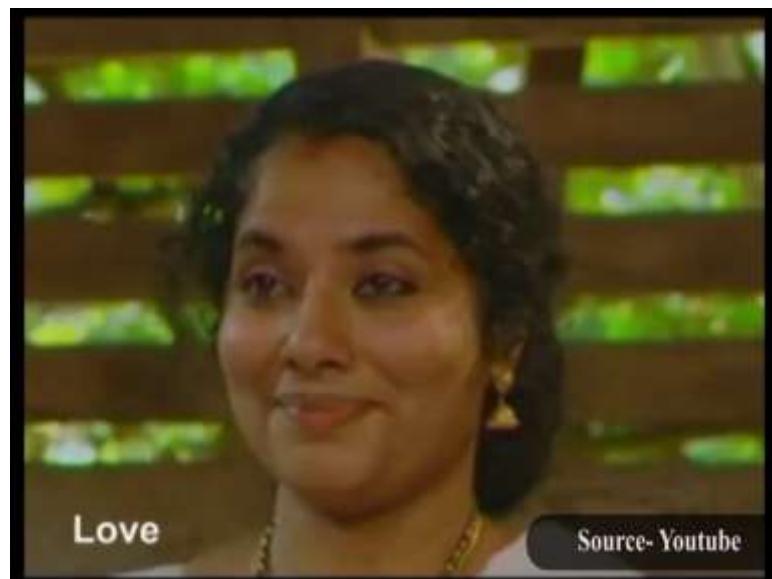
Now that we have come to facial muscles, so in our next lecture we would exclusively be talking about the musculature analysis of facial expression.

Introduction to Psychology
Prof. Braj Bhushan
Department of Humanities and Social Sciences
Indian Institute of Technology, Kanpur

Lecture – 27
Emotion - Musculature Analysis of Facial Expressions

In the previous lecture we saw that the muscle of the face it plays an important role, and it gives feedback to us as human beings to derive our subjective experience. In our day to day life we see whole lot of expressions, and this very lecture would be exclusively dedicated to those types of expressions. Some of it which is a specially customized to make you understand things and some of it which has been borrowed from real life sources.

(Refer Slide Time: 00:52)



Look at this very video. See love on her face.

(Refer Slide Time: 01:09)



Valour.

(Refer Slide Time: 01:21)



Grief.

(Refer Slide Time: 01:38)



Humour.

(Refer Slide Time: 01:48)



Wonder.

(Refer Slide Time: 02:01)



Fear.

(Refer Slide Time: 02:18)



Revulsion.

(Refer Slide Time: 02:27)



Anger.

(Refer Slide Time: 02:39)



Tranquility.

Now, in this very video you realize that there was a trained artist, she was required to show the given emotion on the face and there was a very pronounced change in terms of the muscle of the face. And this tells you that if you start making the musculature analysis of the face you would come across a fantastic area of research altogether.

(Refer Slide Time: 03:20)

Facial Expressions: Musculature Analysis

- Ekman (1992) asked the participants not to pose emotions but to follow muscle instruction to produce universal facial expressions.

Now Paul Ekman he took a set of participants and asked them to pose emotions, but he did not name the emotion that the individual had to pose rather he asked the participants only to follow the instructions to move the muscles. Now universal facial expressions were derived not by asking the participants to pose an emotion, but by asking them simply to follow the muscle movement instruction.

(Refer Slide Time: 03:49)

Facial Expressions: Musculature Analysis



Look at this very image. The image that you see right now it tells you how different muscles are spread throughout our face. And it is basically the movement of these

muscles on the face that is held responsible for adding whatever expression is visible on the surface of the face.

Now, in this very example what Ekman tried doing was that we saw till now is an emotion is there you experience, it you experience, it somebody recognizes it. In this case you wanted the participants just to follow the instruction. If I ask you have to make your lips move apart; that is it there is no other expression. And then he try to make out that how is it that the movement of these muscles they actually are responsible not only for say making the world understand your expression, but he said that the subjective experience that you have that also can be affected by it. And I must say that I thankful to the colleague Professor Satyaki Roy who agreed for this photo sessions. So, you will see whole lot of photographs where he has posed for certain emotions.

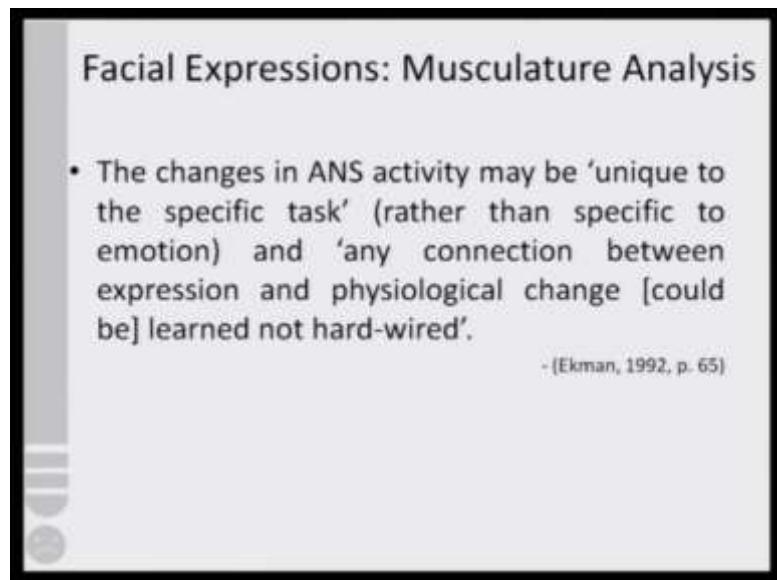
(Refer Slide Time: 05:29)

Facial Expressions: Musculature Analysis

- The voluntary performance of 'certain facial muscular actions generated involuntary changes in autonomic nervous system (ANS) activity' (p. 64).

Now, I am quoting Ekman who said that the voluntary performance of certain facial muscular actions generate involuntary changes in the autonomic nervous system activities.

(Refer Slide Time: 05:37)



Facial Expressions: Musculature Analysis

- The changes in ANS activity may be 'unique to the specific task' (rather than specific to emotion) and 'any connection between expression and physiological change [could be] learned not hard-wired'.

- (Ekman, 1992, p. 65)

And the changes in the ANS activity may be unique to the specific task rather than specific to emotion and any connection between expression and physiological change could be learned and it is not hard wired. We saw in the previous lecture that the left side of the face had little pronounced expression compared to the right side of the face. And based on the musculature analysis also it has been found that the left side of the face is more intense in terms of exhibiting the expression. So, right from musculature analysis as well as the behavioral analysis we will measure that has been taken. In both the cases it has been uniformly it has been observed that the left side of the face is more pronounced.

Now we will not go in to the details, but just to mention to you that there are coding systems, there are softwares, there are specialized programs which are specifically designed to understand the musculature analysis.

(Refer Slide Time: 06:48)

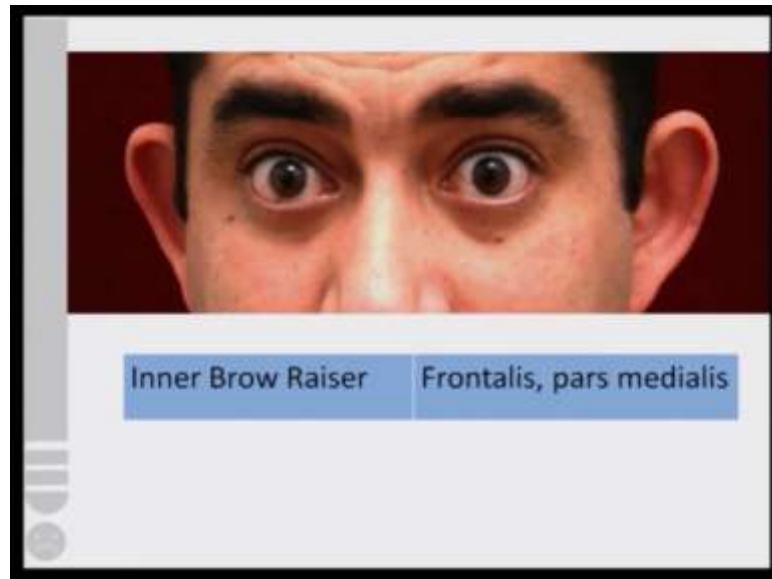
Facial Expressions: Musculature Analysis

- FACS (Facial Action Coding System; Ekman & Friesen 1978)
- MAX (Maximally Discriminative Facial Moving Coding System; Izard 1979)
- FEAT (Facial Expression Analysis Tool; Kaiser & Wehrle 2001): Automatically measure facial expressions using FACS expert system.

First one is FACS the facial action coding system which came forward in 1978 and Ekman and Friesen they are the one who gets the credit for it. The second is that MAX the Maximally Discriminative Facial Moving Coding System by Izard and then the FEAT; Facial Expression Analysis tool.

So, now if you look another one or two more systems have coming into being and people are trying their best right from the computer generated analysis, software assisted analysis to pure behavioral measure to physiological measure changes in the ANS activities to understand emotion.

(Refer Slide Time: 07:36)

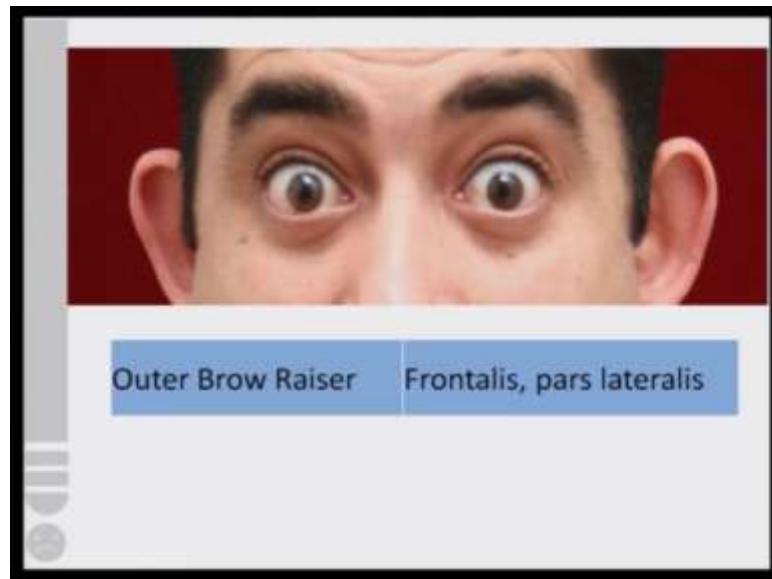


Inner Brow Raiser Frontalis, pars medialis

Now look at this very face, you see the expression understand that we would be looking at full lot of faces and our attempt is to understand the facial expression with respect to musculature analysis.

Now, the expression was very distinct, because you looked at the eyes. This was the most dominant feature here in the face. So, what do you saw that the inner eyebrow they were raised and then in the right side you find frontalis and the pars medialis the two muscles which are basically responsible for raising the inner brow.

(Refer Slide Time: 08:27)



Outer Brow Raiser Frontalis, pars lateralis

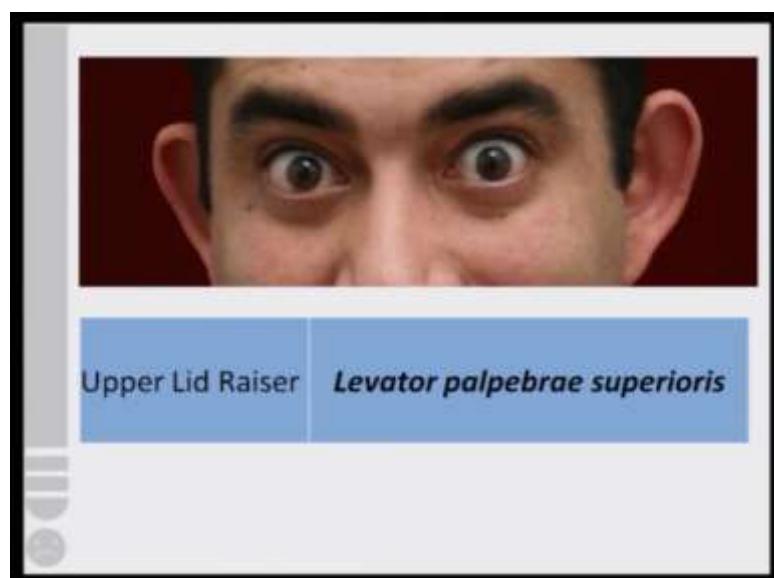
You have the other expression now and then you realize that there is an outer brow movement to. An outer brow raiser again notes frontalis and pars lateralis these two muscles which are responsible for this type of a movement.

(Refer Slide Time: 08:45)



You see anger and then you see that the brow has been lowered now. Now supercilius muscle the corrugators and depressor they are one which are responsible for lowering down the eyebrows. And then in the first two cases you saw surprise, now you see anger.

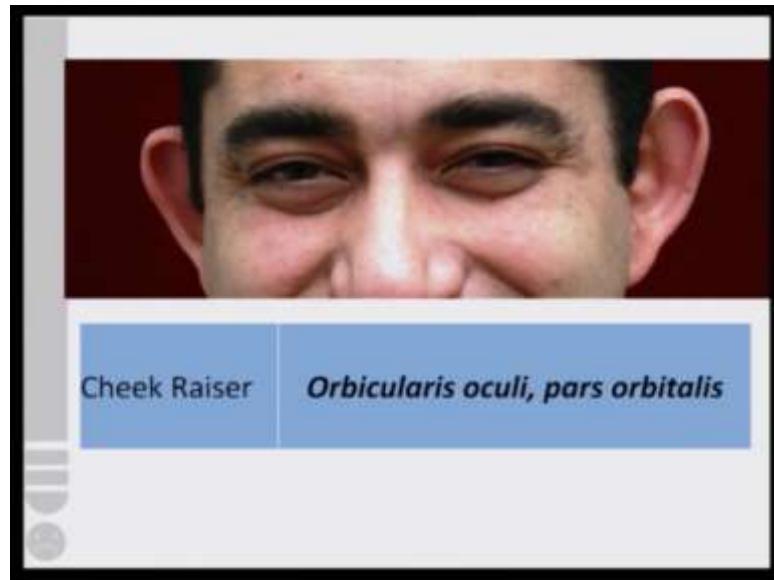
(Refer Slide Time: 09:15)



You see another expression now. Now, it is not only the eyebrow it is also the lips which

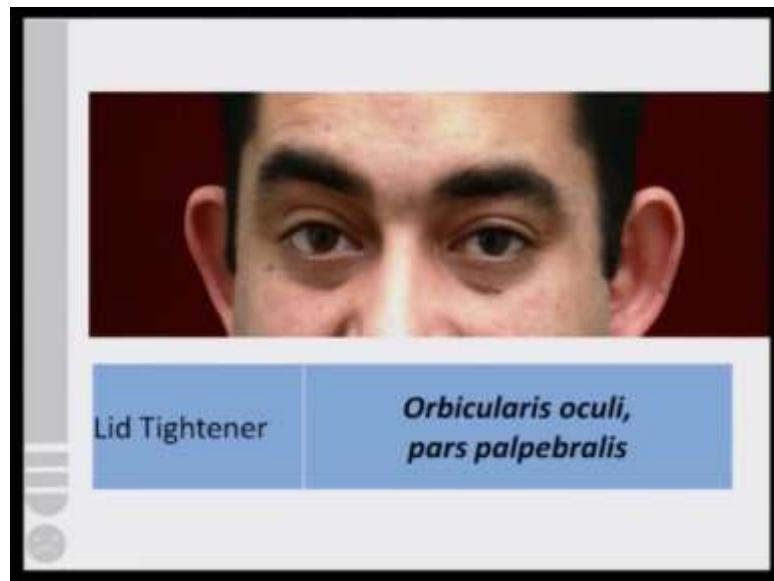
gives you the impression of the emotion. Now you have the upper lid raiser.

(Refer Slide Time: 09:33)



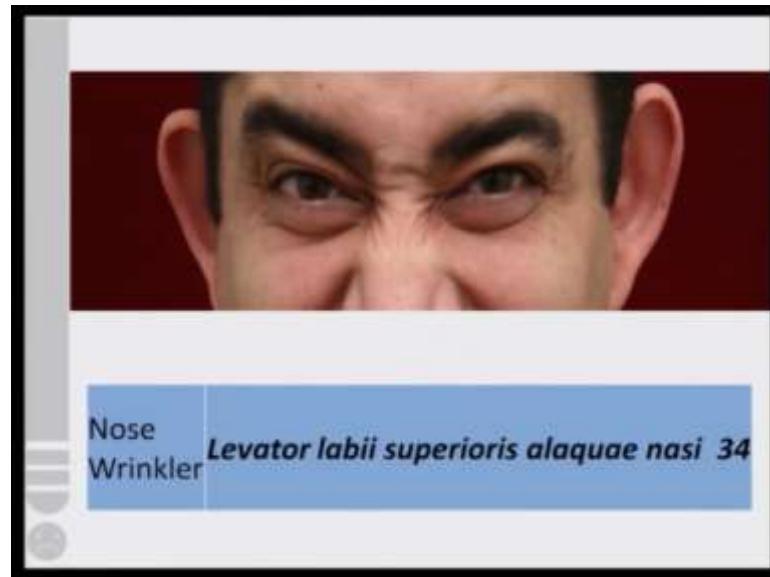
Another emotional expression and then you have the cheek raiser. Now it is orbicularis oculi muscle and the pars orbitalis muscle which are responsible for this movement.

(Refer Slide Time: 09:50)



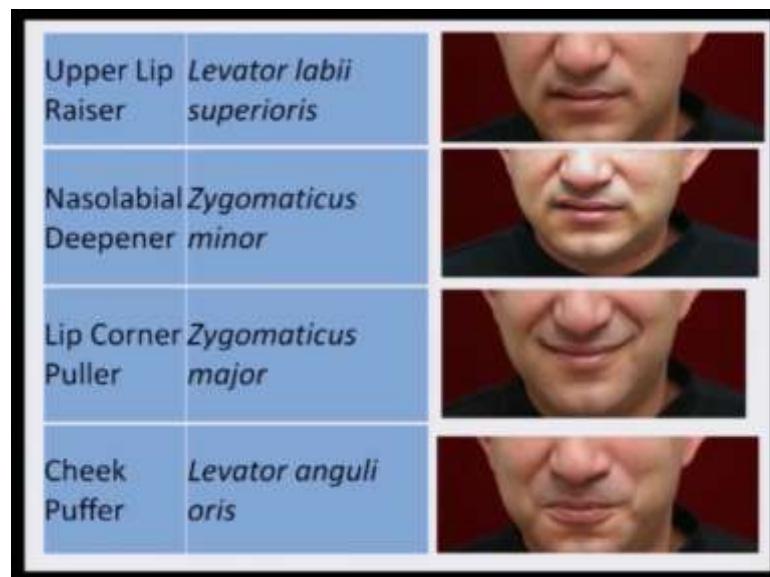
You see disgust on the face and then you have the lid tightener, here disgust of an extreme order and then you say that the wrinkler have actually made the image very very distinct.

(Refer Slide Time: 10:01)



Another emotion, change in the expression.

(Refer Slide Time: 10:20)



Now you saw the upper lip raiser, you saw the deepener, again the lip puller and the cheek puffer. And these were different muscle movements which lead to change on the expression.

(Refer Slide Time: 10:46)

Dimpler	<i>Buccinator</i> 40	
Lip Corner Depressor	<i>Depressor anguli oris</i> 41	
Lower Lip Depressor	<i>Depressor labii inferioris</i> 37	
Chin Raiser	<i>Mentalis</i> 43	

Look at the changes in the lip movement now. And then you realize dimpler, the lip corner depressor, the lower lip depressor and the chin raiser. They different activities are been performed and these expressions are distinctly visible because specific muscle have moved.

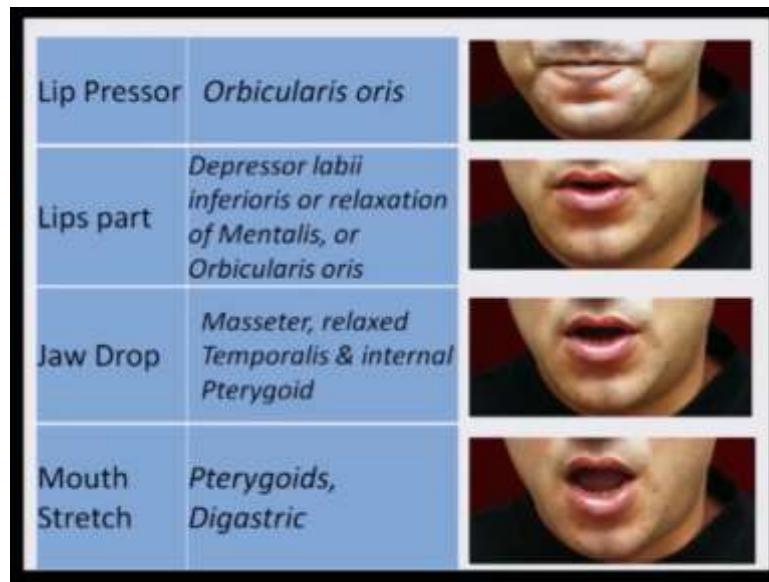
(Refer Slide Time: 11:15)

Lip Puckerer	<i>Incisivii labii superioris & Incisivii labii inferioris</i>	
Lip stretcher	<i>Risorius w/ platysma</i>	
Lip Funneler	<i>Orbicularis oris</i>	
Lip Tightener	<i>Orbicularis oris</i>	

Look at the changes now this is what we see in our day to day life. Now, you have the lip puckerer, the lip stretcher, the lip funneler and the lip tightener and based on the movement of the muscle the expression on the lips and the area close to the lips that

change.

(Refer Slide Time: 11:46)



Look at the change in the expression now. So, you have the lip pressor, the lips part, the jaw drop and the mouth stretch. Again intensity of this expression varies because certain muscles have moved in a little different way.

We have exclusively focused ourselves on human expression. You will be surprised to know that whole lot of research is going on in the area of development of humanoid robots and Takanishi lab in Japan they have come forward with humanoid robots which can express like human beings. And this entire development of humanoid robot is based on human facial expression.

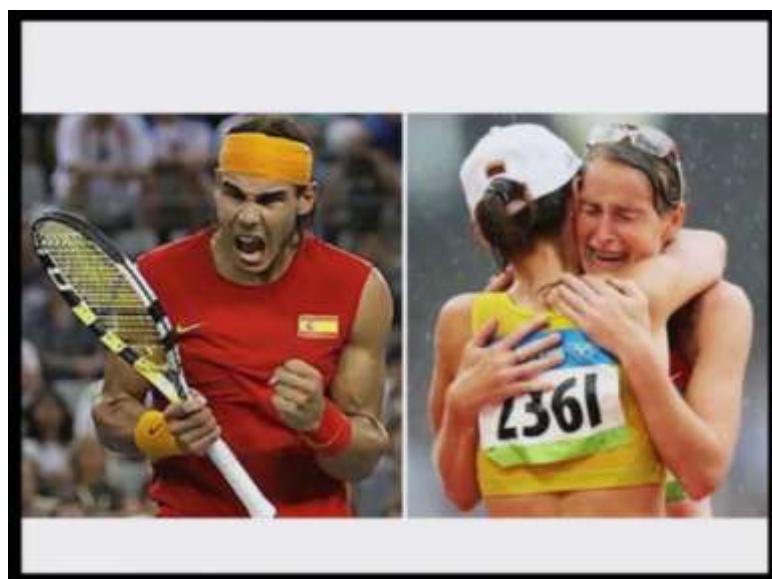
Look at this video. What we have seen till now was posed emotions by one of my colleagues and then robotic expressions from Takanishi lab.

(Refer Slide Time: 14:45)



Look at the images on your screen now. These are real life expressions from two very renowned sport persons of India. When you look at them in action, what you see, what is there on their face? Is it that the athlete is going to make a jump, and this is extremely distressful activity? Is it the anticipatory target that she visualizes she would be able to achieve, that has added to the expression on the face. In the case of the tennis player is it the joy, is it pride, the sense that you have defeated somebody. These are very interesting things in life to observe.

(Refer Slide Time: 15:38)



Look at these two expressions. First look at the tennis player and you will see in the previous case the tennis player had won the match and what was the expression, and in this case you see the tennis player and his expression. Look at the two women athletes there can you make out whether they have won the game therefore they are emotional they have lost and therefore they are emotional.

From the field of sports you would realize whole lot of expression where establishing the distinction is extremely difficult.

(Refer Slide Time: 16:20)



Look at the Indian wrestler Sushil Kumar in the Olympics when he was given the medal how mesmerized he was.

(Refer Slide Time: 16:32)



Look at another face; this was one of the most sensitive photographs which were published during the Gujarat riot. Each muscle on the face is pulled to the maximum expression. Now for understanding purposes it is fine you are looking at the muscle movement, but what appears on the face is something that is more much more remarkable than the world looks at. You must have seen artist when they sketch. One of my colleagues she agreed do for this shoot where she sketching various human expressions look at them and see that the stroke of the pencil is basically used to demarcate change on the expression which actually represents the change in the muscle that right now we are talking about.

Now, here you have artist who is actually sketching human face and you can see here how the pencil moves. Now each stroke here of the pencil actually defines the fine certain specific expression is being put on the face. You can see here right now it has to do with the eyes the eyebrows and gradually it goes to the lips. Can you sense the expression on the face, the emotion on the face? And now you have special strokes, these are the stroke that actually helps you understand exactly what emotion has been put on the face.

Now understanding of emotion when you look at certain artifacts, of course you have sculpture, you have figurative arts, you have sand sculpture, you have stone sculptures, free hand sketching like this where actually the artist will always try to minimize or

maximize something on the face and that something is actually it has to do with the emotion. Now if you ask these artists that fine, do you know what facial muscles are actually involved in the expression of this type of emotion? I am sure the artist would not be able to do so.

Even though the artist does not know which facial muscle actually has to do with increasing the intensity or decreasing the intensity of a particular expression he or she definitely makes usage of it. And this is interesting dynamics when you try to understand the allied areas of knowledge and how emotion influences these areas.

Besides representing human sketch and if you look at the dance performance, in the beginning we saw the expression of the dancer look at this live program and see the expression on the face. Now I will show you a very different type of a situation this is not an artistic presentation, this the clip that has been taken out from the news item when people in a given tribe they were suppose to get displaced, dislodged because of the construction of the dam and see the expression on the face.

We started this lecture with the video when the artist was changing expression on the face; we are ending this lecture with again a video and this is from a documentary. The reason I am showing this to you because you can see that when you mourned the death of a beloved one in the family the way you cry is also culturally driven. What we have actually done is We have seen how people express, how muscles are responsible, how the cultural issues the norms they influence and you can see a mix. See this very video and see the impact of culture, death of somebody we mourn a women cries and the pattern of cry is culturally driven.

Actually what you find is moment of bereavement when the family members are actually crying they are showing their emotion after the death of a family member. See how culture influences the crying behavior, the display of sadness in these two videos.

Key words - musculature analysis, facial expressions, lip, cheek

Introduction to Psychology
Prof. Braj Bhushan
Department of Humanities and Social Sciences
Indian Institute of Technology, Kanpur

Lecture – 28
Emotion - Biological Basis of Emotions

We have till now looked at the face. We have till now looked at the behavior, the culture we have not still entered into the brain. So, right now in this very lecture we would be doing two things we would be looking at the biological aspect of emotional response one, and two and most importantly, we would try to understand why is it that human emotions is given so much of importance, what is its significance?

(Refer Slide Time: 00:54).

Basic Emotions

- Each basic emotion elicit organized set of responses in each person.
- For example, heartbeat and blood flow increases in the state of anger.
- As a consequence disproportionately high amount of blood goes to one's hand, thus preparing a person to fight.
- Irrespective of whether one actually engages in a real fight or not emotion prepares the body for it.

Now each basic emotion that we come forward with is associated with certain degree of bodily activities say for instance heart beat blood flow will increase in the state of anger. for instance. But what happens in the case of anger as a consequence of increase in the heart beat and increase in the blood flow, there is a disproportionately high amount of blood that goes into one's hand. So, if I am extremely angry my heart beat increases, the blood flow increases and then you realize that in the hands there is no disproportionately high blood flow which basically has again biological significances, survival significance because it prepares you to fight, your increased blood flow in the hand prepares you to fight against the external threat. You are angry your anger will make you move towards

the source of anger and you will try to over power the source of anger and there, for you have to be biologically ready, else you would be compromising with your survival. In order to make you ready for know that engagement in the state of anger, the blood flow and the heart beat both increases.

Now if you evaluate this argument with your real life experience, many a times you get angry, but you do not revert back to the source of anger. Every time you get angry you do not fight. So, is it that the heart beat of the blood pressure it suggest, what you call gets modified if you plan to fight the blood the blood flow will increase heart beat will increase and, if you do not intend to fight it will not increase that does not happen. The biochemical regulations of emotion suggest that whether you fight or not heart beat will by default increase, blood flow will by default increase this increase in turn will now get extended to the two arms and you will be ready for fight.

This is an interesting mechanism towards the end we will again look at this very slide trying to say and understand that we are social human beings we are social creatures. So, irrespective of whether you actually engage in the real fight or not, the state of emotion prepares your body for it. So, heart beat by default will increase blood flow will by default will increase, but then the social moderator works and that social moderator tells you whether to fight or not; that means, that even though you are biologically ready for an act socially your brain controls you.

(Refer Slide Time: 03:58)

Survival Significance

- There is an innate tendency to prioritize threat stimuli compared to the neutral stimuli in terms of processing.
- Because of their survival significance the brain identifies threatening stimuli very fast.
- Therefore, fear-inducing animals such as snakes or negative emotional expression such as anger are identified relatively fast.

Now there is an innate tendency in us to prioritize the threat stimuli compared to the neutral stimuli or any other stimuli. Why is threat given so much of importance? If I look at an angry creature in front of me I develop great degree of fear and this threat actually has to do with survival significance, I consider that the anger, that the object in front of me has towards me and is reflecting at me could prevent me from my healthy survival and in order to what you call help myself survive this figure induction very fast it propagates to the brain and on the priority bases the brain processes it and therefore, you would realize that all threats are always processed in priority compared to any other emotion. You are say for instance now sitting with your friends you are cutting jokes at each other you are enjoying the evening and suddenly you see a snake in the lawn now the fear inducing animal has made you focus at itself rather than anything else in the environment, you will not look at the joke now your processing of the joke freezes at that time when you process the fear at the snake as induced in you .

So, this is now an interesting mechanism in terms of emotional expressions. Now emotional expressions and survival significance it suggests that there is an attentional preference for such a stimuli and therefore, reptile such as snakes, angry human beings all such things will always get priority in terms of processing by the brain. now understanding the biological significance of processing certain type of emotion let us look at the activation pattern, what illicit emotions remember we are exclusively interested right now looking at it from the bio chemical regulation point of view number one ,the Neuro-Chemical Bench mark.

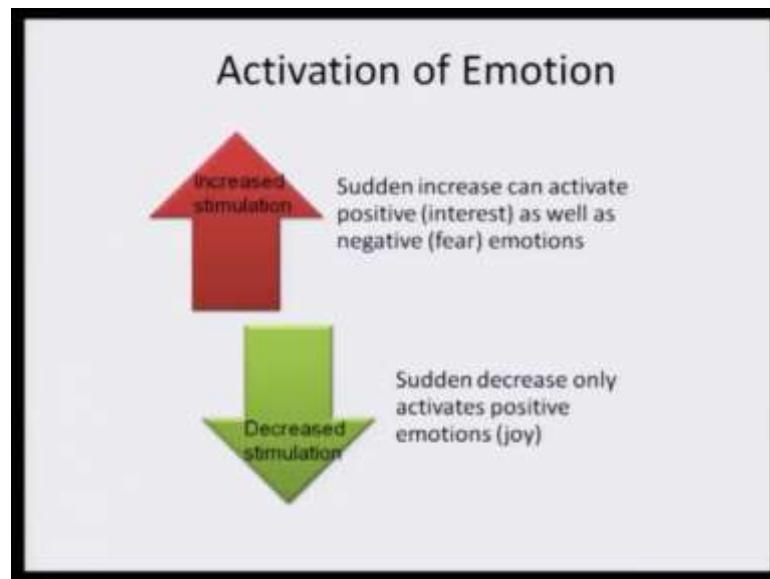
(Refer Slide Time: 06:25)

Activation of Emotion

- Elicitors of emotions:
 - Neuro-chemical
 - Sensorimotor
 - Motivational
 - Cognitive

The change in the Neuro-Chemistry, Sensorimotor changes and of course, two behavioral factors the Motivational and Cognitive factors.

(Refer Slide Time: 06:45)

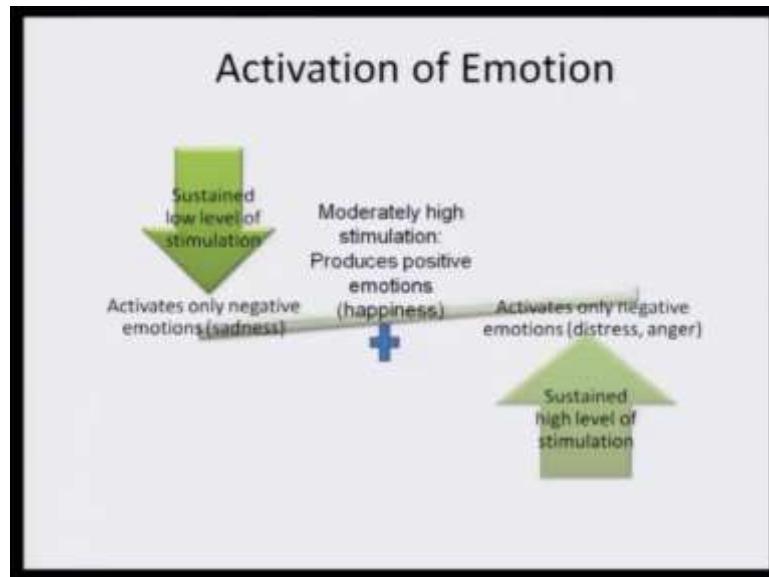


Now, look at the activation pattern and compare it in terms of the increase versus of decrease situation. If the stimulation has increased what would happen and if the stimulation level decreases then, what type of emotion they will lead to, if there is a sudden increase in the stimulation then it can activate positive as well as negative emotion, say for instance interest, happiness these are positive emotion. Fear for instance

are negative emotion, but then sudden increase in the stimulation can lead to either of them know your interest happiness fear all of them are dependent on sudden increase in the stimulation level. Therefore, increase stimulation sudden increase in the stimulation is going to be either positive or negative emotion it can lead to, but if there is a sudden decrease in the stimulation level, and then it is by default going to lead to positive emotions.

So, there is an interesting thing, sudden increase it could be positive it could be negative if it is sudden decrease then it has to be positive emotions only. What if the stimulation level is sustained in the previous case what we discussed was either sudden increase or sudden decrease, now we are talking about sustained level.

(Refer Slide Time: 08:09)

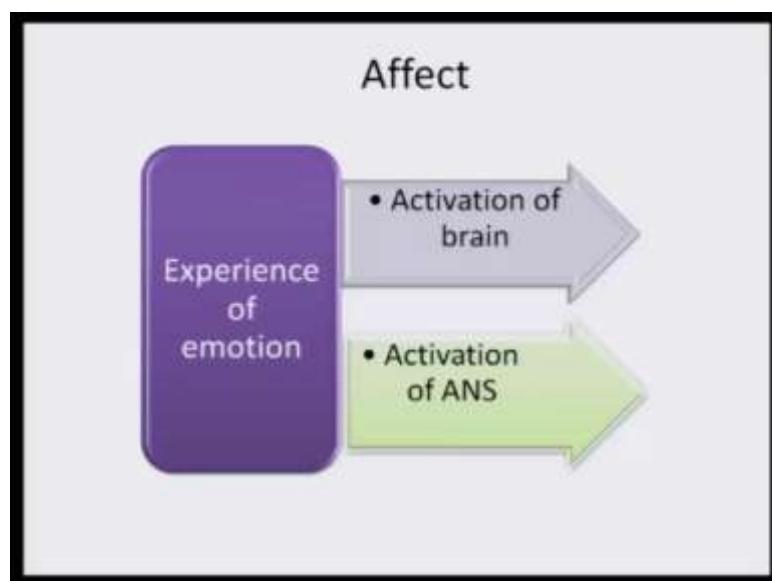


Now if there is sustained low level of stimulation, then it can now lead to negative emotions, if there is a sustained high level of a stimulation then it will activate only negative emotions. Interesting thing you see here sustained low level of stimulation and sustained high level of stimulation and in both the cases it is negative emotions. For instance sustained low level of stimulation might say activate sadness, if you take negative emotions like distress and anger it has high degree of stimulation, but it is negative in nature.

So, sustained low and high level of stimulation both by default will have negative emotions, but if you have moderately higher stimulations then it is bound to produce

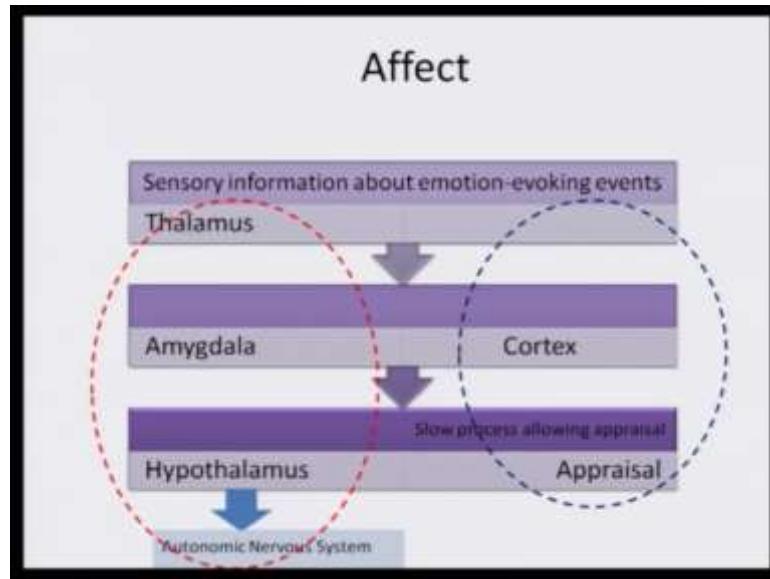
positive emotion. Happiness for instance now happiness is basically a moderately higher stimulation. So, this is an interesting pattern , what we saw in the previous line was that if there is a sudden decrease in the stimulation then you can think of a positive emotion and in second case what we are seeing is that if we do not have sustained low or high level, if the level of a stimulation is moderate then you experience positive emotion, you do not experience negative emotion, but if high or low degree of a stimulation is sustained then it is only negative emotion.

(Refer Slide Time: 09:40)



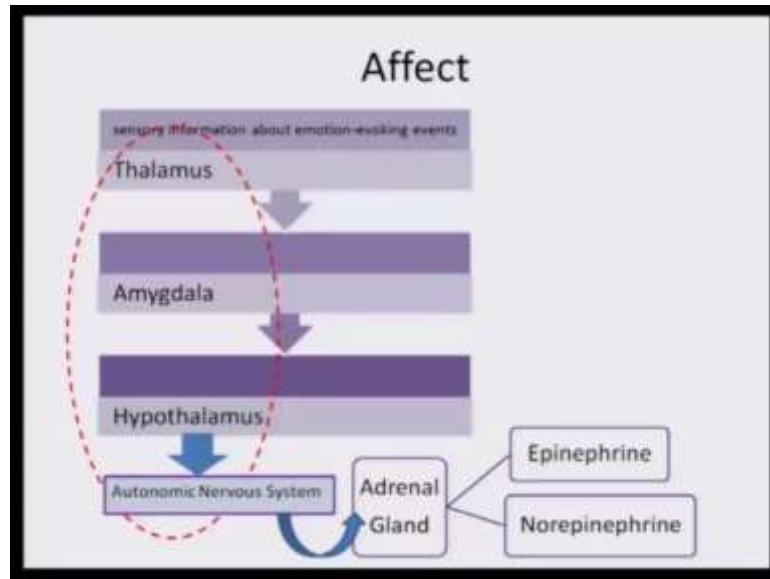
Now, experience of emotion in terms of biochemical regulation will depend on the activation of the brain and the activation of the autonomic nervous system in the beginning itself we said that the heart beat increases the blood flow increase. So, these are level of changes in the activation of the autonomic nervous system. Now usually what happens in our day to day experience we have the sensory formation which now invokes emotion in us You remember we had talked about no how sensation is carried in the brain in the first lecture when we started on perception.

(Refer Slide Time: 10:32)



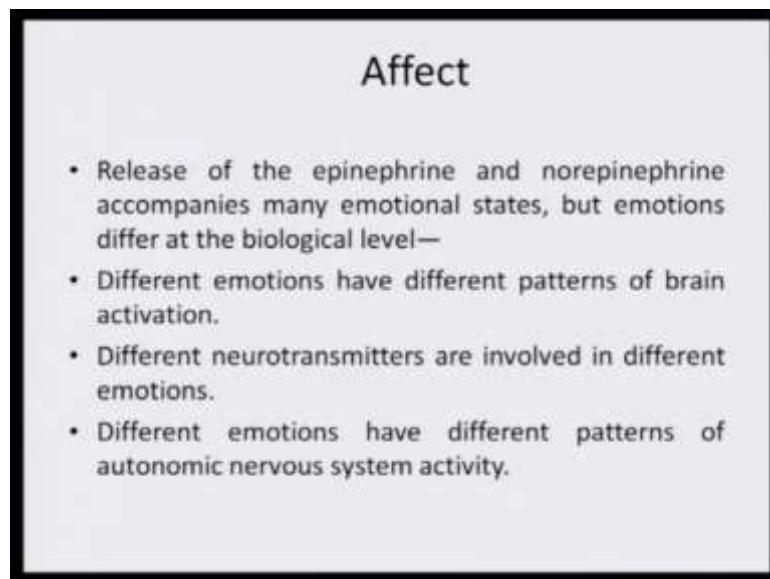
Now sensory information which will invoke emotion has two path ways that it takes in the brain. One ,where you the thalamus the amygdala the hypothalamus which finally, goes to the activation of the autonomic nervous system, the second, where the sensory information goes to the higher cortical areas and this is a very slow process, but what it does is that it allows you to go for appraisal of the emotion; that means, the two systems are working one which basically moves very fast, something that is circled here red and you realize that thalamus, amygdala ,hypothalamus the ANS systems get activated this is a very fast system, the slow system which actually now allows you to go for appraisal of your emotion little later we talk about the about the appraisal mechanism also and then you realize that the higher cortical areas are involved it is a slow process, but then once the appraisal is done again it will affect the behavioral outcome.

(Refer Slide Time: 11:44)



So, the first channel that we were talking about once the autonomic nervous system is put in to action adrenal gland comes in to picture and then you have the secretion of epinephrine, norepinephrine.

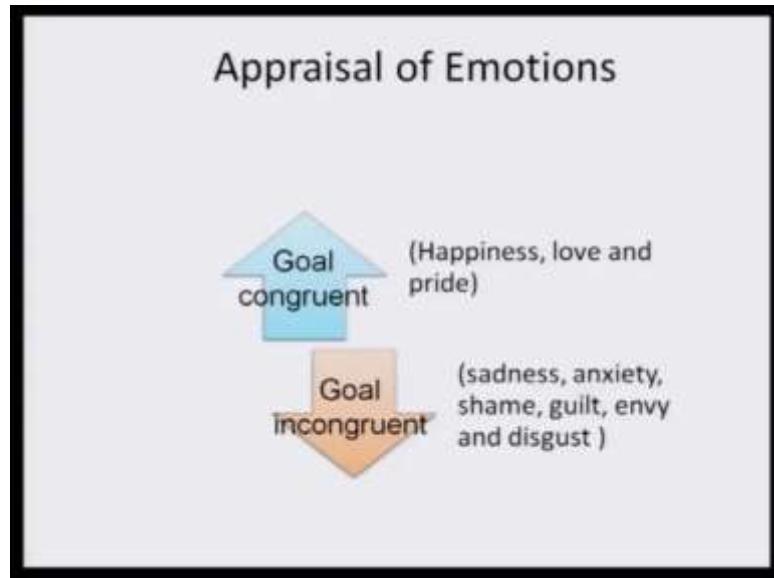
(Refer Slide Time: 11:53)



Now release of epinephrine or norepinephrine it accompanies many emotional states. For instance you have different emotions which have different patterns in the brain activation level there is difference even at the level of neurotransmitter ,you have difference at the level of ANS activity also. But remember one thing the slow process the second channel

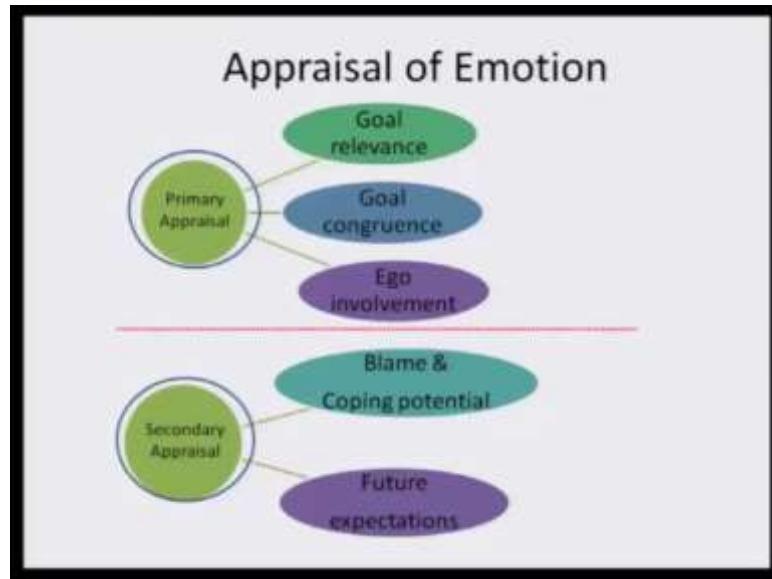
that we were talking about which had to do with appraisal of the system. Now this you know the emotion invoking sensation that had been received by the brain when the high cortical area processes it looks at emotions largely from two perspectives how congruent or incongruent it is to the goal.

(Refer Slide Time: 12:52)



So, you can clearly divide emotions in terms of goal congruent emotions and goal incongruent emotions. The goal congruent emotions will involve happiness love and pride, emotions like sadness anxiety shame guilt envy and disgust they all become the part of the goal incongruent emotions. Now what happens? The goal congruent and the goal incongruent emotion they are primarily looked upon from two points of view the primary appraisal mechanism.

(Refer Slide Time: 13:10)



And the secondary appraisal mechanism the first filter is the primary appraisal primary appraisal looks at the goal relevance goal congruence and ego involvement these are the only three criteria's. Secondary appraisal mechanism looks only at two things the blame part who has to be blamed or who has to be given credit. If you think of the opposite of it and the coping potential and then the second filter get the secondary appraisal mechanism uses this that of the future expectation.

Let us come to primary appraisal first, goal relevance means you have set a goal for yourself you remember in one of the lecture we said that it is attainment of the goal or it is blockade in the process of attaining the goal know that helps you memorize things and this is how emotion and memory they merge together. You have set a goal for yourself the emotion that you are experiencing how relevant it is to the goal that you have set for yourself. Whether it is congruent with the goal or incongruent with the goal second important thing and the third is the level of ego involvement whether you find your ego to be involved in that situation or not, say for instance, if you find your ego to be involved in the process, it is goal congruent, it is goal relevant. You can think of pride because your ego will get inflated in that process. If you do not consider this to be a situation that can boost your ego why will you pride.

So, you understand these things . So, just goal relevance goal congruence and the level of the degree of involvement of your ego only these three filters are used and this leads to

the primary appraisal mechanism. Most of our emotions when they are undergoing the process of appraisal are easily identified easily experienced only on the basis of primary appraisal. In certain cases secondary appraisal mechanism comes in to picture where you search for the individual who has to be blamed for it, if there is say something that has gone missing then you search for potential person to be blamed who has to be held accountable, who has to be held responsible for it and the reverse of it would be credit if there is something that has been achieved then you say “yes, I have done it” you take the credit, you get pride out of it. Besides blame and pride the second thing is the coping potential if the damage has been caused if someone has been found to be blamed for it can I cope with it? Can I handle this loss? And depending on whether the answer is yes or no. And how capable you find yourself coping with no this situation works as an important factor for secondary appraisal and second important filter for secondary appraisal mechanism is the future expectation.

If same situation I experience in the near future in the days to come would I will be able to handle it that is the future expectation. If I find myself capable enough of handling the situation now if it comes on my way then fine I am comfortable with it I cannot have a negative emotions if I think that I lost in this situation and I find myself incompetent to handle this, it comes in the future also then fine I am bound to develop negative emotion in this situation I would be scared of it.

(Refer Slide Time: 17:14)

Aspects of Emotions

- Feelings: It entail private and subjective feeling.
- Physiological arousal: It is a state of distinctive somatic and autonomic responses.
- Action orientation: Fight-flight

Therefore, the feeling the physiological arousal and the action orientation the fight, flight responses, all these three things comes in to picture when we look at emotion .At the end I would like to show you a video footage the reason I am showing you this video footage is that you see people in uniform, who are suppose to execute a command, while you are on duty you are performing the profession responsibility, emotions war and you have a congruent appraisal mechanism appraisal and then the emotional reaction.Look at this very episode.

(Refer Slide Time: 18:07)



Look at this man in sky blue shirt who is trying to save himself from this lathi charge or all his attempts turn in vain he is surrounded by police men and then comes this officer he saw this lonely target surrounded by so many police men and came to stop others from hitting this young men. You saw somebody who did not think, who did not evaluate the decision of now continuing the lathi charge on a single individual. You saw a set of people, who could not stop themselves know in the process and then you saw somebody who had better a control and thought that one single individual should not be made target, this was a disproportionate reaction. This is cognitive emotional regulation.

I

Lecture 34 Various Perspectives of Personality



Watch later Share

Approaches

- ▶ Type & Trait Approaches
- ▶ Dynamic Approach
- ▶ Learning & Behavioural Approach
- ▶ Humanistic Approach



2:25 / 25:46

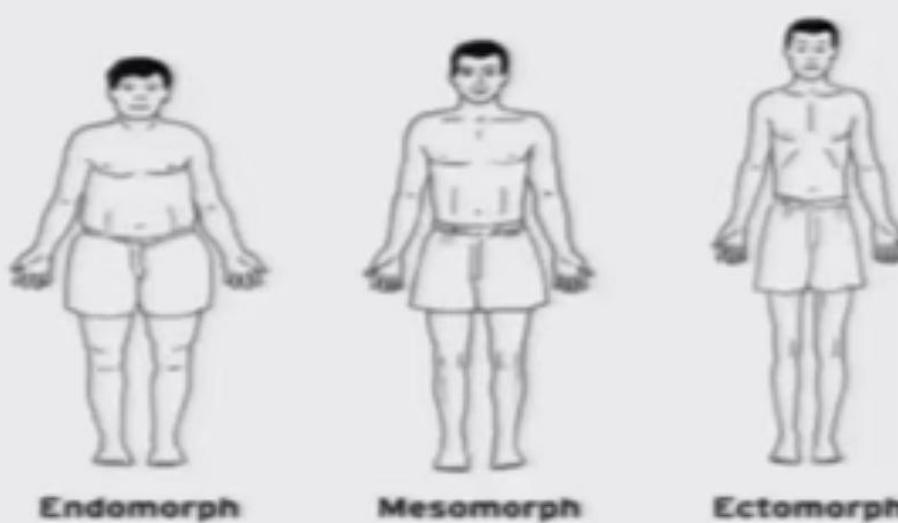


Type Approach: Early

- ▶ Hippocrates (400 BC)
 - ▶ Sanguine Type- Cheerful, active, confident, etc.
 - ▶ Melancholic Type- Depressed
 - ▶ Choleric Type- Hot tempered
 - ▶ Phlegmetic Type- Calm, slow

Type Approach: Early

- ▶ Sheldon's classification
 - ▶ Endomorph (short & plump)- Socialable, relaxed
 - ▶ Ectomorph (tall & thin)- Restrained, self-conscious
 - ▶ Mesomorph (Heavy & muscular)- Noisy, aggressive, & active



I

Lecture 34 Various Perspectives of Personality



Watch later Share

Type Approach: Modern

▶ Eyesenck

- ▶ Extrovert & Introvert
- ▶ Stable & Neurotic
- ▶ Psychotic



5:29 / 25:46



Type Approach: Modern

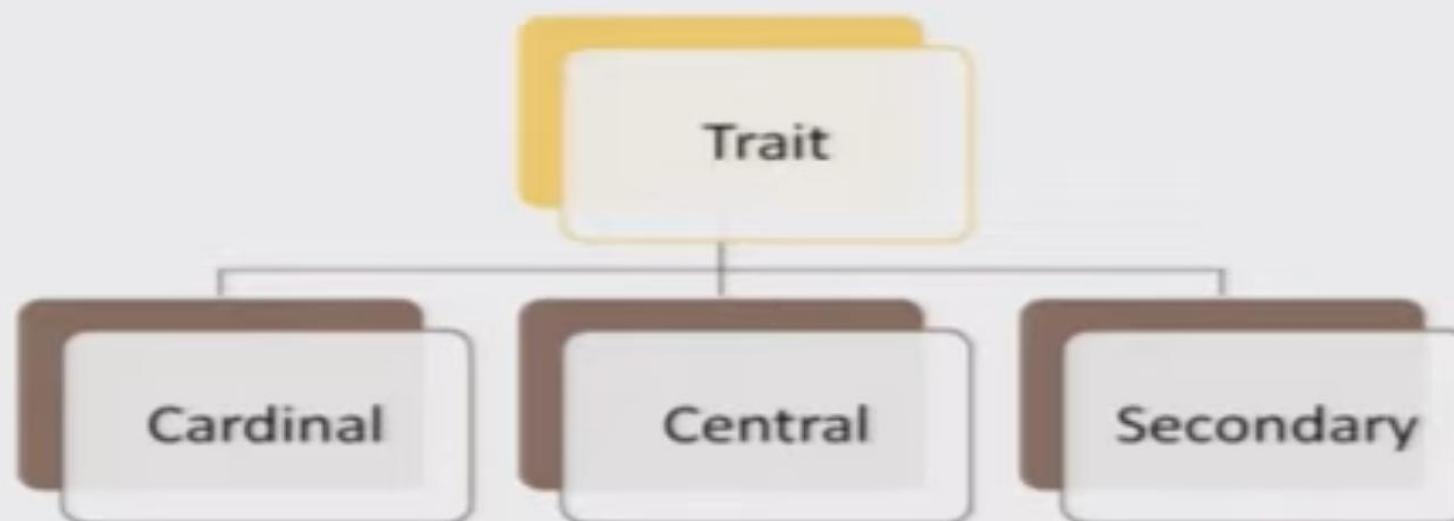
- ▶ Myer Friedman & Ray Rosenman
 - ▶ Type A (competitive, restless, high achieving, active, aggressive)
 - ▶ Type B (opposite of type-A)



Trait Approach

- ▶ Allport

- ▶ Around 18,000 trait-like terms in English language



Trait Approach

▶ Allport

- ▶ **Cardinal traits**- those which are so dominant that nearly all of the individual's actions can be traced back to them. E.g., Gandhian, Machiavellian, etc.
- ▶ **Central traits**- characterize one's behaviour to some extent but not in such a complete way as cardinal trait. It's rare for an individual to have more than 10-12 such central traits.
- ▶ **Secondary traits**- traits that are influential but only within a narrow range of situations.
- ▶ All these three traits constitutes one's psychological life histories



Trait Approach

- ▶ Julian Rotter
 - ▶ Single trait- LOCUS OF CONTROL



Trait Approach

- ▶ Cattell
 - ▶ 16 factors to describe personality



Descriptors of Low Range	Primary Factor	Descriptors of High Range
Impersonal, distant, cool, reserved, detached, formal, aloof <i>(Schizothymia)</i>	Warmth (A)	Warm, outgoing, attentive to others, kindly, easy going, participating, likes people <i>(Affectothymia)</i>
Concrete thinking, lower general mental capacity, less intelligent, unable to handle abstract problems (Lower Scholastic Mental Capacity)	Reasoning (B)	Abstract-thinking, more intelligent, bright, higher general mental capacity, fast learner <i>(Higher Scholastic Mental Capacity)</i>
Reactive emotionally, changeable, affected by feelings, emotionally less stable, easily upset <i>(Lower Ego Strength)</i>	Emotional Stability (C)	Emotionally stable, adaptive, mature, faces reality calmly <i>(Higher Ego Strength)</i>
Differential, cooperative, avoids conflict, submissive, humble, obedient, easily led, docile, accommodating <i>(Submissiveness)</i>	Dominance (E)	Dominant, forceful, assertive, aggressive, competitive, stubborn, bossy <i>(Dominance)</i>
Serious, restrained, prudent, taciturn, introspective, silent <i>(Desurgency)</i>	Liveliness (F)	Lively, animated, spontaneous, enthusiastic, happy go-lucky, cheerful, expressive, impulsive (Surgency)
Expedient, nonconforming, disregards rules, self indulgent <i>(Low Super Ego Strength)</i>	Rule-Consciousness (G)	Rule-conscious, dutiful, conscientious, conforming, moralistic, staid, rule bound <i>(High Super Ego Strength)</i>
Shy, threat-sensitive, timid, hesitant, intimidated (Threctia)	Social Boldness (H)	Socially bold, venturesome, thick skinned, uninhibited (Parma)
Utilitarian, objective, unsentimental, tough minded, self-reliant, no-nonsense, rough (Harria)	Sensitivity (I)	Sensitive, aesthetic, sentimental, tender minded, intuitive, refined (Pramia)
Trusting, unsuspecting, accepting, unconditional, easy (Alaxia)	Vigilance (L)	Vigilant, suspicious, skeptical, distrustful, oppositional (Protension)
Grounded, practical, prosaic, solution oriented, steady, conventional (Praxernia)	Abstractedness (M)	Abstract, imaginative, absent minded, impractical, absorbed in ideas (Astria)
Forthright, genuine, artless, open		Private, discreet, nondisclosing

Major Framework

- ▶ **Psychoanalytic**

- ▶ Freud

- ▶ Erikson

- ▶ Jung

- ▶ Adler

- ▶ **Behaviourist**

- ▶ Skinner

- ▶ Bandura

- ▶ **Humanistic**

- ▶ Maslow

- ▶ Rogers

- ▶ **Indian concept**



Sigmund Freud

- ▶ Topography of mind:
 - Conscious
 - Unconscious
 - Preconscious
- ▶ Structures:
 - Id
 - Ego
 - Super ego



Sigmund Freud

- ▶ Stages of Psycho-sexual Development:
 - Oral Stage (Birth – 2 years)
 - Anal Stage (2 – 3 years)
 - Phallic Stage (3 – 5 years)
 - Latency Stage (5 – 11 years)
 - Genital Stage (11-)
- ▶ Important propositions:
 - ▶ Oedipus complex
 - ▶ Electra complex
 - ▶ Castration Anxiety



Sigmund Freud

- ▶ **Stages of Psycho-sexual Development:**
 - Oral Stage (Birth – 2 years)**
 - Anal Stage (2 – 3 years)**
 - Phallic Stage (3 – 5 years)**
 - Latency Stage (5 – 11 years)**
 - Genital Stage (11-)**
- ▶ **Important propositions:**
 - ▶ **Oedipus complex**
 - ▶ **Electra complex**
 - ▶ **Castration Anxiety**



Watch later Share

Alfred Adler

- ▶ **Individual Psychology**
- ▶ Important concepts:
 - ▶ Mastery
 - ▶ Power
 - ▶ Superiority
 - ▶ Status
- ▶ **Inferiority Complex**
- ▶ Inferiority is innate & universal



Compensation
Over compensation



0:27 / 22:55



Alfred Adler

- ▶ **Inferiority Complex** striving for superiority & 'upward drive'
- ▶ **Masculine Protest**
- ▶ Striving to be stronger & powerful as a compensation for feeling of being inferior & unmanly.
 - ▶ 1912- Replaced 'Masculine Protest' with Striving for superiority.
 - ▶ This was further replaced as striving for success or perfection.
- ▶ **Ordinal position of child**

Alfred Adler

▶ **Ordinal position of child**

- ▶ First-born- Gets undivided attention. Experience traumatic experience of dethronement when a new baby is born.
- ▶ Second-born- Are achievement oriented.
- ▶ Last-born- Are at risk of being problem child; Strong feeling of inferiority & lacks independence; highly motivated to surpass elder siblings; achievement oriented & competition minded.
- ▶ Lone child- Inflated self-concept & exaggerated sense of superiority; too dependent; lacks feeling of cooperation & social interest.



Carl Gustav Jung

► Analytical Psychology

- **Complex:** A network of ideas bound together by a common emotion or set of feelings.
- **Collective unconscious:** Past experience of human race.
 - ▶ Consists of primordial images that include memory traces of human past as well as our prehuman & animal ancestry.
 - ▶ Many types of myths, legends, & religious beliefs are stored in collective unconscious.
 - ▶ Complexes are individualized & constitute contents of personal unconscious.
 - ▶ Archetypes are generalized & constitute contents of collective unconscious

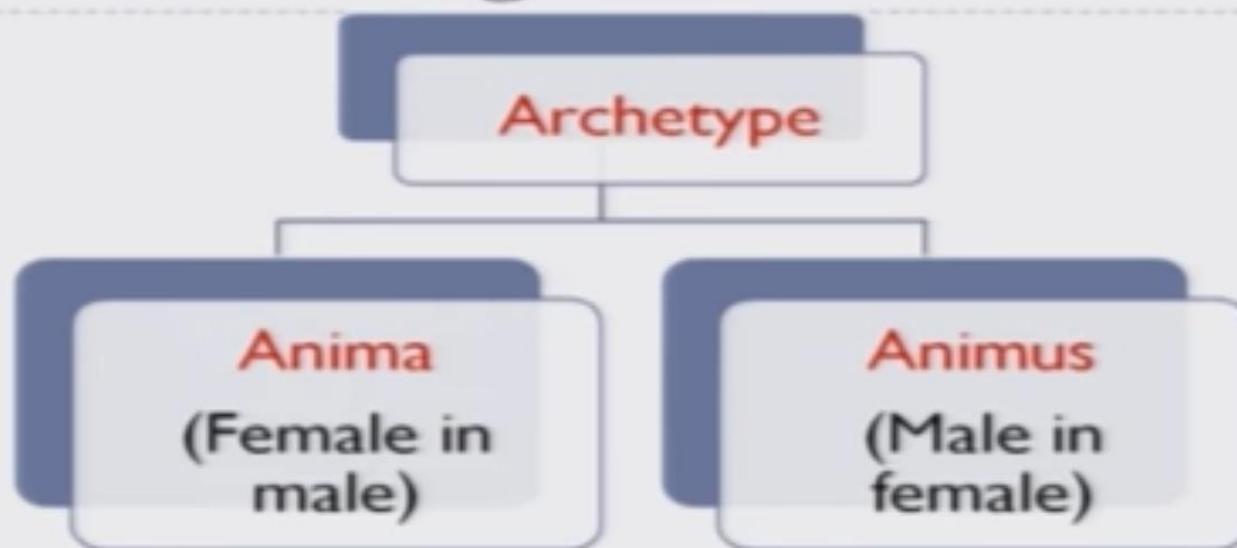


Carl Gustav Jung

- ▶ **Personal unconscious:** Develops out of any of the individual's conscious experiences that had been repressed.
 - ▶ Consists of repressed infantile memories, forgotten events or subliminally perceived experiences of a person.
 - ▶ It varies from person to person and is unique to the person concerned.
 - ▶ Contents of personal unconscious are called complex.
 - ▶ Word Association Test was developed to bring forth these complexes.
- ▶ **Individuation:** Means by which each of us become distinct from each other.



Carl Gustav Jung



- ▶ **Self-** Governs the process of individuation that is useful & creative aspect of the unconscious and is made productive and conscious.
- ▶ **Persona-** It reflects the way people wishes to be perceived by others.
- ▶ **Shadow-** Animal instincts inherited by human beings.

Erick Erickson

▶ Search for ego integrity

- ▶ All stages (of psychosexual development) have both psychosexual as well as psychosocial aspects of growth & change
 - ▶ Infancy (corresponds to oral stage): 1st year
 - ▶ Early Childhood (corresponds to anal stage): 2-3 years
 - ▶ Play age (corresponds to phallic stage): 4-6 years
 - ▶ School Age (corresponds to latency stage): 6-11 years
 - ▶ Adolescence (corresponds to fifth stage): 12/13-19 years
 - ▶ Young Adulthood (roughly twenties)
 - ▶ Middle Adulthood (30-60/ 65 years)
 - ▶ Maturity (65 – death)



Erick Erickson

- ▶ **Search for ego integrity**
- ▶ Identification with models
- ▶ Shifting goals & clarity of values



Karen Horney

- ▶ **Psychoanalytic Interpersonal Theory**
- ▶ **Basic anxiety:** Arises in childhood when the child feels helpless in a threatening world.
- ▶ **Basic hostility:** Usually accompanies basic anxiety and grows out of resentment over the parental behaviour that led to anxiety in the first place.
- ▶ **Three models of social behaviour:**
 1. Moving towards others- Excessive compliance
 2. Moving against others- Satisfaction through ascendance and dominance of others
 3. Moving away from others- Self protection by withdrawal



Behaviourist: Dollard & Miller

- ▶ Early social learning
 - ▶ Attempted testing Freudian concept (Neurotic behaviour) in lab (on rats)
 - ▶ Translated concepts of psychoanalysis into learning theories



Behaviourist: B.F. Skinner

- ▶ Shaping: The behaviour of the organism is gradually shaped or molded through a series of successive approximations by selectively reinforcing certain responses and not reinforcing the others.
- ▶ Superstitious behaviour is developed due to accidental reinforcement.

The subject acts as though certain response produced reinforcement whereas the reality is that there is no necessary connection between that response and reinforcement.

The response is commonly followed by reinforcement merely due to the fact that both response and reinforcement occur frequently.



Behaviourist: B.F. Skinner

- ▶ **Shaping** (the method of successive approximations)
 - Initially vaguely reinforcing a behaviour according to one's desire
 - Once established, search for variations that come little closer to what one wanted, until the respondent shows a behaviour ordinarily not seen in normal circumstances
- ▶ **Behaviour modification**
- ▶ Design culture such that good gets rewarded and bad extinguishes





Watch later Share

Alfred Adler

▶ Individual Psychology

▶ Important concepts:

▶ Mastery

▶ Power

▶ Superiority

▶ Status

▶ Inferiority Complex



Compensation

Over compensation

▶ Inferiority is innate & universal



0:27 / 22:55



Alfred Adler

- ▶ **Inferiority Complex** striving for superiority & 'upward drive'
- ▶ **Masculine Protest**
- ▶ Striving to be stronger & powerful as a compensation for feeling of being inferior & unmanly.
 - ▶ 1912- Replaced 'Masculine Protest' with Striving for superiority.
 - ▶ This was further replaced as striving for success or perfection.
- ▶ **Ordinal position of child**

Alfred Adler

▶ **Ordinal position of child**

- ▶ First-born- Gets undivided attention. Experience traumatic experience of dethronement when a new baby is born.
- ▶ Second-born- Are achievement oriented.
- ▶ Last-born- Are at risk of being problem child; Strong feeling of inferiority & lacks independence; highly motivated to surpass elder siblings; achievement oriented & competition minded.
- ▶ Lone child- Inflated self-concept & exaggerated sense of superiority; too dependent; lacks feeling of cooperation & social interest.



Carl Gustav Jung

► Analytical Psychology

- **Complex:** A network of ideas bound together by a common emotion or set of feelings.
- **Collective unconscious:** Past experience of human race.
 - ▶ Consists of primordial images that include memory traces of human past as well as our prehuman & animal ancestry.
 - ▶ Many types of myths, legends, & religious beliefs are stored in collective unconscious.
 - ▶ Complexes are individualized & constitute contents of personal unconscious.
 - ▶ Archetypes are generalized & constitute contents of collective unconscious

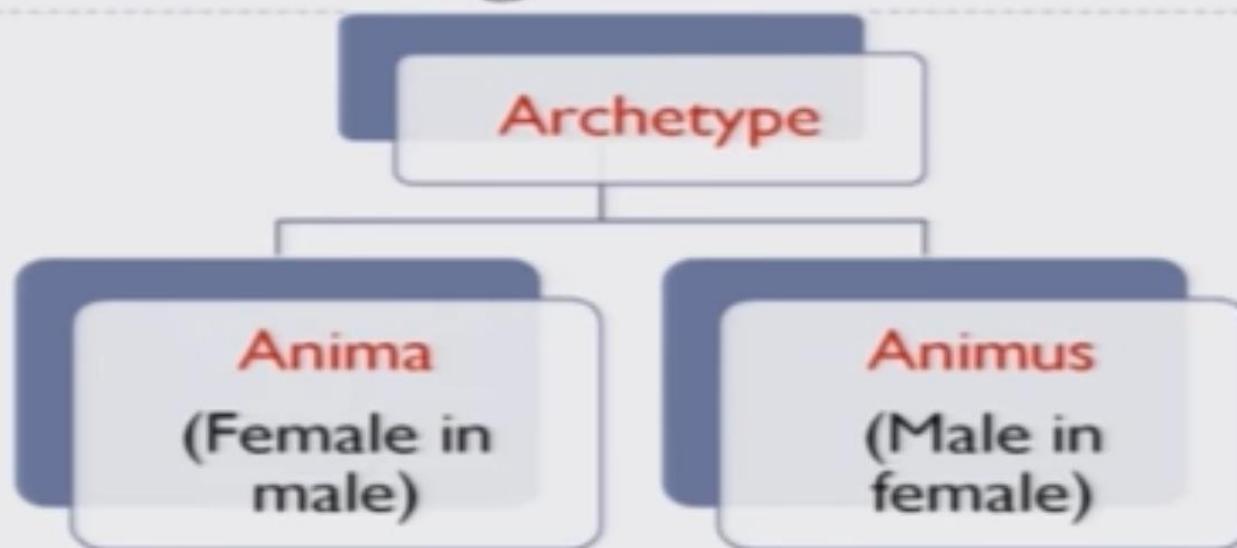


Carl Gustav Jung

- ▶ **Personal unconscious:** Develops out of any of the individual's conscious experiences that had been repressed.
 - ▶ Consists of repressed infantile memories, forgotten events or subliminally perceived experiences of a person.
 - ▶ It varies from person to person and is unique to the person concerned.
 - ▶ Contents of personal unconscious are called complex.
 - ▶ Word Association Test was developed to bring forth these complexes.
- ▶ **Individuation:** Means by which each of us become distinct from each other.



Carl Gustav Jung



- ▶ **Self-** Governs the process of individuation that is useful & creative aspect of the unconscious and is made productive and conscious.
- ▶ **Persona-** It reflects the way people wishes to be perceived by others.
- ▶ **Shadow-** Animal instincts inherited by human beings.

Erick Erickson

▶ Search for ego integrity

- ▶ All stages (of psychosexual development) have both psychosexual as well as psychosocial aspects of growth & change
 - ▶ Infancy (corresponds to oral stage): 1st year
 - ▶ Early Childhood (corresponds to anal stage): 2-3 years
 - ▶ Play age (corresponds to phallic stage): 4-6 years
 - ▶ School Age (corresponds to latency stage): 6-11 years
 - ▶ Adolescence (corresponds to fifth stage): 12/13-19 years
 - ▶ Young Adulthood (roughly twenties)
 - ▶ Middle Adulthood (30-60/ 65 years)
 - ▶ Maturity (65 – death)



Erick Erickson

- ▶ **Search for ego integrity**
- ▶ Identification with models
- ▶ Shifting goals & clarity of values



Karen Horney

- ▶ **Psychoanalytic Interpersonal Theory**
- ▶ **Basic anxiety:** Arises in childhood when the child feels helpless in a threatening world.
- ▶ **Basic hostility:** Usually accompanies basic anxiety and grows out of resentment over the parental behaviour that led to anxiety in the first place.
- ▶ **Three models of social behaviour:**
 1. Moving towards others- Excessive compliance
 2. Moving against others- Satisfaction through ascendance and dominance of others
 3. Moving away from others- Self protection by withdrawal



Behaviourist: Dollard & Miller

- ▶ Early social learning
 - ▶ Attempted testing Freudian concept (Neurotic behaviour) in lab (on rats)
 - ▶ Translated concepts of psychoanalysis into learning theories



Behaviourist: B.F. Skinner

- ▶ Shaping: The behaviour of the organism is gradually shaped or molded through a series of successive approximations by selectively reinforcing certain responses and not reinforcing the others.
- ▶ Superstitious behaviour is developed due to accidental reinforcement.

The subject acts as though certain response produced reinforcement whereas the reality is that there is no necessary connection between that response and reinforcement.

The response is commonly followed by reinforcement merely due to the fact that both response and reinforcement occur frequently.



Behaviourist: B.F. Skinner

- ▶ **Shaping** (the method of successive approximations)

Initially vaguely reinforcing a behaviour according to one's desire

Once established, search for variations that come little closer to what one wanted, until the respondent shows a behaviour ordinarily not seen in normal circumstances

- ▶ **Behaviour modification**

- ▶ Design culture such that good gets rewarded and bad extinguishes





Behaviourist: Albert Bandura

Modelling

- ▶ Most of our learning is acquired through observation or modelling
- ▶ We observe others performing behaviours and retain those behaviours for further use

Process governing modelling:

- ▶ **Attention** (For modelling, it is essential that we must attend to the behaviour of other persons)
- ▶ **Retention** (The observed patterns of behaviour must be symbolically retained)
- ▶ **Motor production** (Conversion of cognitive representations into appropriate actions)
- ▶ **Motivation**

Behaviourist: Albert Bandura

Determinants of learning:

- ▶ Antecedent determinants: Activates the person and guides behaviour
- ▶ Consequent determinants: Maintains behaviour after being activated

Major factors in consequent determinants:

- ▶ ***External reinforcement:*** obtained through direct experience
E.g., money, praise, reward, punishment
- ▶ ***Vicarious reinforcement:*** based upon vicarious experience
E.g., learning through observation of consequences of others behaviour
- ▶ ***Self produced reinforcement:*** Every person sets some standards for themselves & behave accordingly. In such situation they don't need any external reinforcement to maintain their behaviour



Behaviourist: Albert Bandura

- ▶ Reciprocal determinism- Environment causes behaviour and behaviour causes environment as well
- ▶ Personality as an interaction among environment, behaviour and the person's psychological processes



Humanistic: Abraham Maslow

Self-actualization Theory

- ▶ Human motives are innate and are arranged in the ascending hierarchy of priority



Humanistic: Abraham Maslow





Humanistic: Abraham Maslow

D motives

- ▶ These are essentially survival needs
- ▶ Even love and esteem are instrumental in the maintenance of health
- ▶ These needs are genetically, like instincts
- ▶ He calls them instinctoid (instinct-like)



10:55 / 25:38



Humanistic: Abraham Maslow

- ▶ To self actualize means to reach the peak of one's potential so that one becomes a fully functional person
- ▶ Need for self actualization is an umbrella need that covers 17 metaneeds/ being values
- ▶ Metaneeds have no hierarchy and are equally potent
 - E.g., need for perfection, wholeness, richness, beauty, etc.
- ▶ Self actualization is not an all-or-none process, rather is a matter of degree
- ▶ No human beings are perfectly self actualized
- ▶ Esteem needs of Maslow are similar to Adler's "striving for superiority" and Erikson's "need for mastery"



Humanistic: Abraham Maslow

Truth

Goodness

Beauty

Unity, wholeness, and transcendence of opposites

Aliveness

Uniqueness

Perfection and necessity

Completion

Justice and order

Simplicity

Richness

Effortlessness

Playfulness

Self-sufficiency

Meaningfulness

Metaneeds

Dishonesty

Evil

Ugliness or vulgarity

Arbitrariness or forced choices

Mechanization of life

Band uniformity

Sloppiness, inconsistency

Incompleteness

Injustice and lawlessness

Unnecessary complexity

Environmental impoverishment

Strain

Grim, humorless

Dependency

Meaninglessness

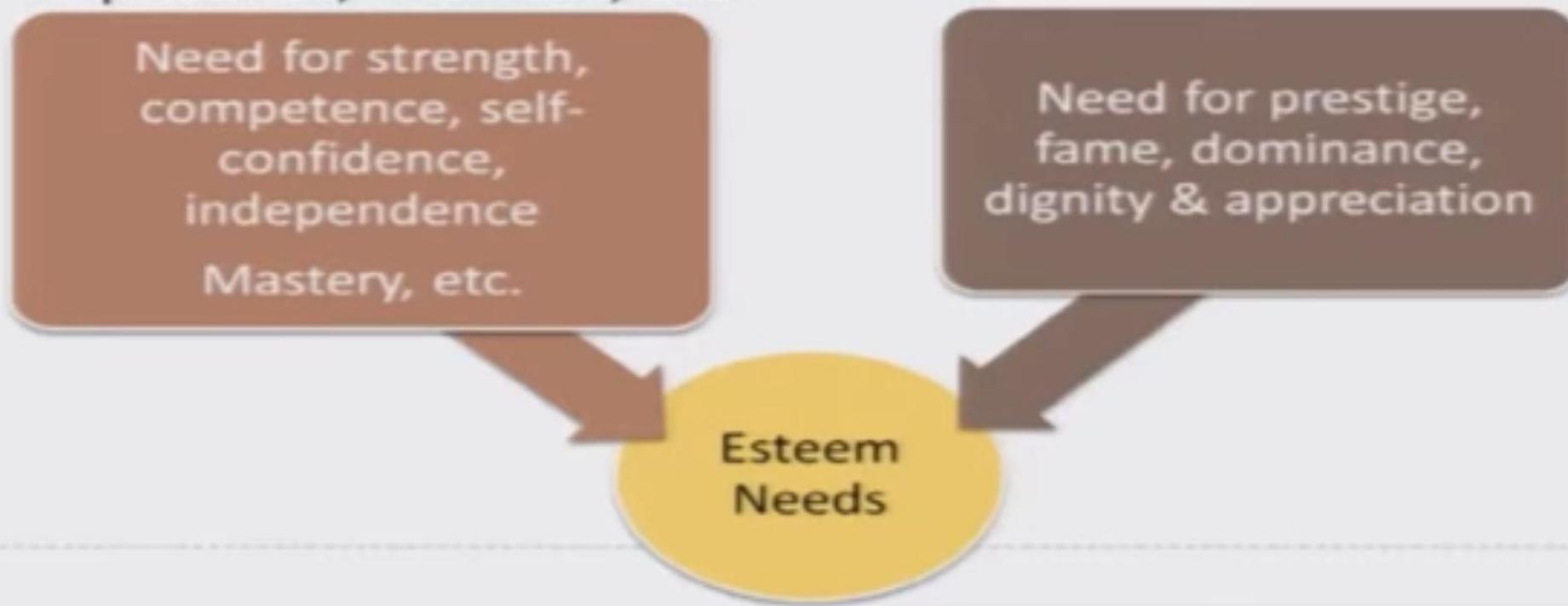
Humanistic: Abraham Maslow

- ▶ Lower level needs (physiological & safety) must be satisfied before higher level needs become motivator of behaviour
- ▶ Physiological needs are cyclic needs
- ▶ Physiological needs can be wholly satisfied. This is not true in case of other higher needs
- ▶ Safety needs can also be wholly satisfied
- ▶ Under stressful conditions, or when survival is threatened, we can “regress” to a lower need



Humanistic: Abraham Maslow

- ▶ Satisfaction of self-esteem needs produce feelings like self confidence, capability, strength, worth, etc.
- ▶ Thwarting of self-esteem needs lead to feelings of inferiority, helplessness, weakness, etc.



Humanistic: Carl Rogers

Self Theory / Person-centered Theory

- ▶ Based upon his experiences as a client-centered therapist
- Organism refers to a totality of experiences going on within the whole individual at a particular moment
- Organism is the locus of all experiences
- The totality of experiences constitute both conscious and unconscious experiences
- Phenomenal field/ Perceptual field consists of totality of experiences
- Experiences of phenomenal field are inner experiences; the sources may either be external, internal, or both

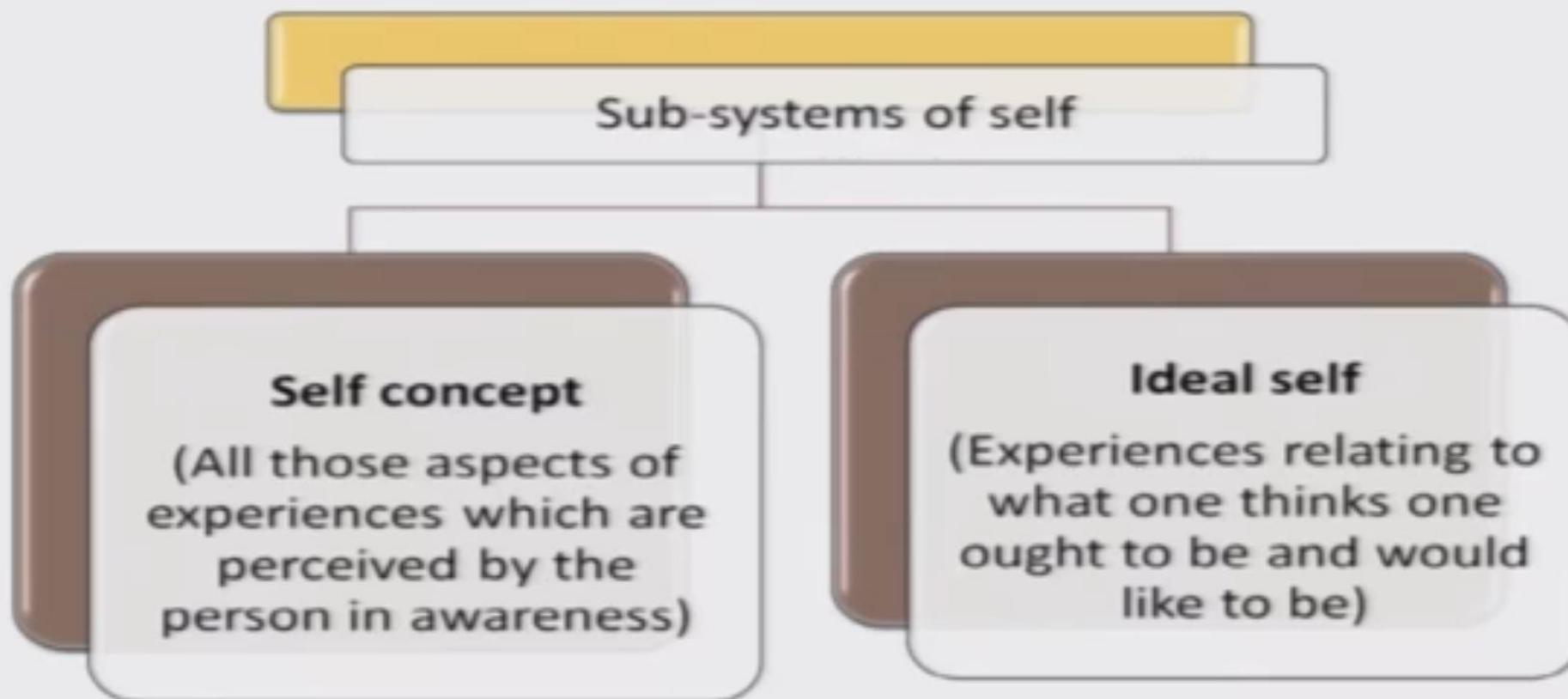


Humanistic: Carl Rogers

- ▶ Self emerges from the totality of experiences
- ▶ Self is a fluid, changing gestalt
- ▶ Self may be either in awareness or out of awareness
- ▶ With the development of self, the infant begins to understand good or bad as well as it tries to evaluate its experiences as positive or negative
- ▶ Self is not a separate dimension of personality (as stated by Freud)
- ▶ An individual does not possess a self, rather self incorporates the whole organism



Humanistic: Carl Rogers

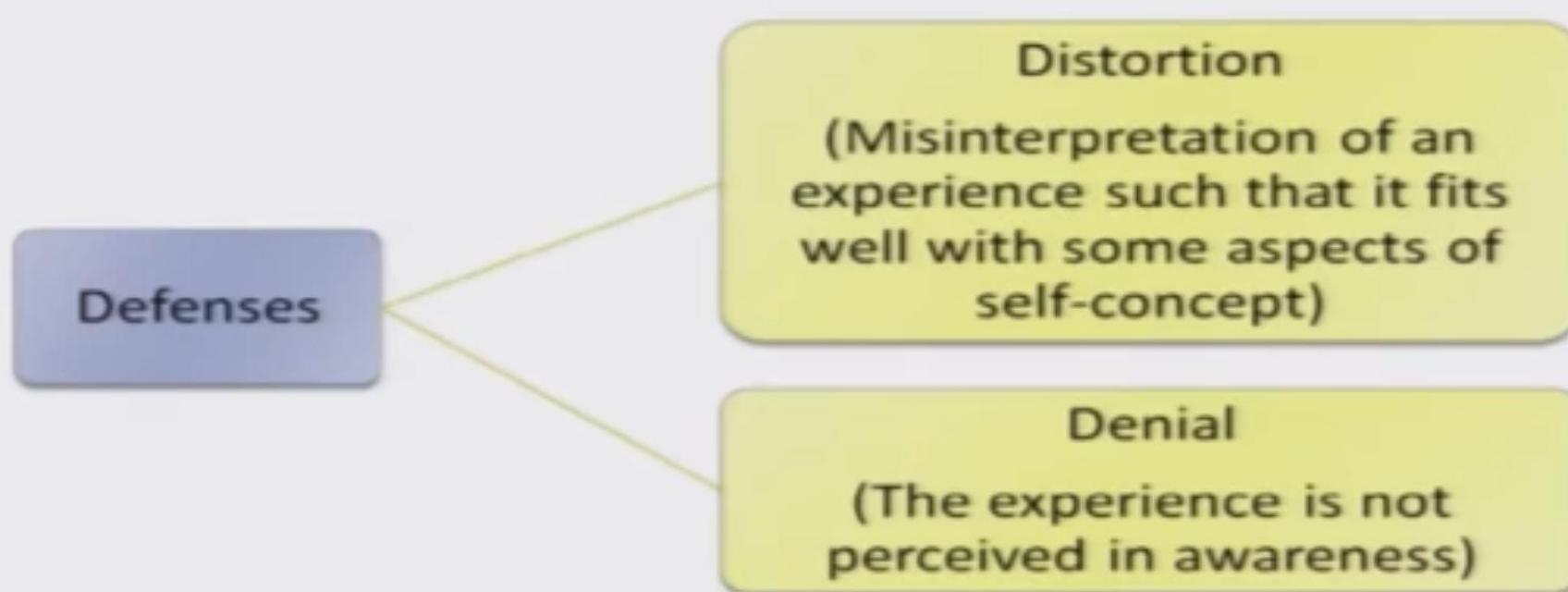


Humanistic: Carl Rogers

- ▶ Once the self-concept is formed, change and further learning becomes difficult
- ▶ Those experiences which are inconsistent with the self-concept are either distorted or denied by the individual
- ▶ Self concept is different from real self / organismic self
- ▶ Self concept is limited to only those experiences which we are aware of
- ▶ Organismic self may also include those experiences which are beyond our awareness



Humanistic: Carl Rogers



- ▶ Distortion is more common than denial
- ▶ If the amount of anxiety is high, person's defenses do not work and his personality becomes disorganised
- ▶

Humanistic: Carl Rogers

- ▶ The concept of ideal-self is basically equivalent to the concept of super-ego
- ▶ Ideal-self contains all those attributes or characteristics that one aspires to possess
- ▶ A wider gap between the ideal self and the perceived self indicates incongruence and psychologically unhealthy personality



Humanistic: Carl Rogers

- ▶ Every person has an inherent tendency to actualize his/her unique potential
- ▶ Self-actualization is a growth force that is a part of person's heredity
- ▶ Self-actualization includes biological potentials, but also involves a psychological growth and a moving towards maintaining and enhancing the organism
- ▶ Self-actualization gradually develops from simple to complex.
- ▶ Self-actualization is a dynamic force
- ▶ Basic needs related to self-actualization:
 - Need for positive regards of others
 - Need for self-regard



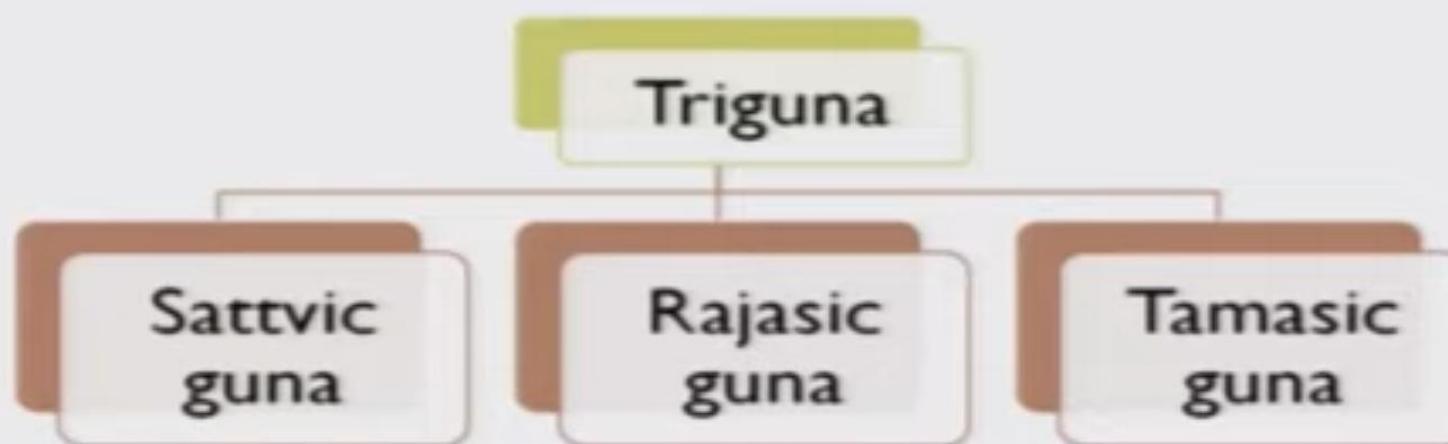
Western Perspective

- ▶ First force- Freudian
- ▶ Second force- Behaviorism
- ▶ Third force- Humanism, including the European existentialism
- ▶ Fourth force- Transpersonal psychology
- ▶ Cue from Eastern philosophies to investigate things like meditation, higher levels of consciousness, and even parapsychological phenomena



Indian Concept of Personality

- ▶ Distinctive psychological characteristics of person (personality)—
- ▶ Svabhava (typical)
- ▶ Prakriti (human nature)
- ▶ Fundamental attributes of prakriti— triguna



Indian Concept of Personality

- ▶ Sattvic guna- root meaning of sattvic is 'to be'
 - ▶ being good, pure, devoted, tolerant, mental equilibrium, mental control, intelligence, knowledge and determination
 - ▶ Rajasic guna- root meaning of rajasic is 'to be dyed'
 - ▶ emotions, passions, pain, restlessness, drive, desire and envy
 - ▶ Tamasic guna- root meaning of tamasic 'gasping for breath'
 - ▶ indifference, uncertainty, misunderstanding, elusion, inertia, fear, arrogance, helplessness, mental imbalance and inactivity
- Murthy and Kumar (2007)



Indian Concept of Personality

- ▶ Sattvic guna- Refers to goodness, harmony and essence
- ▶ Rajasic guna- Refers to passion, mobility and energy
- ▶ Tamasic guna- Refers to dullness, indifference and inertia
- ▶ **Prakriti (personality) comprise of**
 - ▶ temperament
 - ▶ mental make-up
 - ▶ interaction patterns of the individual



Indian Concept of Personality

- ▶ Gunas constantly influence each other; when one dominates, the others automatically recede.
- ▶ The 'changing' nature of the gunas is because they reflect both states and traits

- Paranjpe (2004)



I

Lecture 37 Indian Perspective of Personality and Assessment of Personality



Watch later Share

Personality Assessment



3:58



5:07 / 24:56



Personality Assessment

Projective

Makes a person respond to ambiguous stimuli

The idea is that while doing so the person reveals his/her hidden emotions and internal conflicts

Psychometric

Respond to items



Personality Assessment

Projective

- *Rorschach Ink-blot Test*
- *Thematic Apperception Test*
- Sentence Completion Test
- Word Association Test

Psychometric

- *MMPI (Minnesota Multiphasic Personality Inventory)*
- *16-PF*
- *Myers-Briggs Type Indicator (MBTI)*
- Big-5

Personality Assessment: Ink-blot Test

- ▶ There are ten symmetric inkblots- five in black ink on white paper & two in black and red ink on white paper. Three are multicolored.
- ▶ Subjects have to describe what he/ she perceives on the card. They are encouraged to narrate exhaustive details.
- ▶ After the individual has seen and responded to all the inkblots, the subject is asked to state where he/she sees what he/she originally saw and what makes it look like that.
- ▶ The blot can also be rotated.
- ▶ It is second most widely test used worldwide.
- ▶ Employed for diagnosing underlying thought disorder and to differentiate psychotic from nonpsychotic thinking in cases where the patient is reluctant to openly admit to psychotic thinking.



Personality Assessment: TAT

Henry A. Murray

- ▶ 31 picture cards
- ▶ The test can be administered individually, to groups, or self-administered
- ▶ Individuals can respond orally or in writing
- ▶ Cards include specific subsets for boys, girls, men, and women-
31 picture cards/2 series of 10 cards for boys, girls, men and women
- ▶ Can be administered to 10 years and older individuals
- ▶ They are supposed to stimulate stories or descriptions about relationships or social situations and can help identify dominant drives, emotions, sentiments, conflicts and complexes.

Personality Assessment: TAT

- ▶ Completion time is variable
- ▶ Two basic approaches to interpreting responses to TAT cards- *nomothetic* and *idiographic*.
- ▶ Nomothetic interpretation: Practice of establishing norms for answers from subjects in specific age, gender, racial, or educational level groups and then measuring a given subject's responses against those norms
- ▶ Idiographic interpretation: Evaluating the unique features of the subject's view of the world and relationships
- ▶ Most psychologists prefer idiographic than nomothetic interpretation



Personality Assessment: TAT

- ▶ For interpretation focus is laid on three areas:-
 - ▶ content of the stories
 - ▶ feeling or tone of the stories
 - ▶ subject's behaviors apart from responses
- ▶ Verbal remarks as well as nonverbal actions or signs are considered while making interpretation
- ▶ It reveals -
 - ▶ Attitudes
 - ▶ Fantasies
 - ▶ Inner conflicts
 - ▶ View of the outside world
 - ▶ Assumptions about the world
 - ▶ Optimism or pessimism

Personality Assessment: Sentence Completion

- ▶ The technique was first used as an intelligence test by Hermann von Ebbinghaus in 1897
- ▶ The subject is presented with a series of partial sentences and is asked to complete them in his/ her own words.
 - ▶ *I only wish I had.....*
 - ▶ *My greatest fear is*
 - ▶ *What burns me up is*
- ▶ Rotter Incomplete Sentences Blank is one of the used versions of SCT



Personality Assessment: WAT

- ▶ 100 words to identify abnormal patterns of response
- ▶ Used as a means to identify psychological complexes, along with "intellectual and emotional deficiencies" .

- Jung



Personality Assessment: MMPI

- ▶ **MMPI (Minnesota Multiphasic Personality Inventory)**
- ▶ Hathaway & McKinley (1940, 51)
- ▶ 556 “true/ false/ ?” items
- ▶ 14 scales- 10 clinical scales, 4 supplementary validity scales



Hs- Hypochondriasis

D- Depression)

Hy- Conversion Hysteria

Pd- Psychopathic Deviate

Mf- , Masculinity-Femininity

Pa- Paranoia

Pt- Psychasthenia

Sc- Schizophrenia

Ma- Hypomania

Si or Sie- Social Introversion

CLINICAL SUBSCALES (HARRIS - LINGOES SUBSCALES)

CLINICAL SUBSCALES (HARRIS - LINGOES SUBSCALES)

D1- Subjective depression

D2- Psychomotor retardation

D3- Physical malfunctioning

D4- Mental dullness

D5- Brooding

Hy1- Denial of social anxiety

Hy2- Need for affection

Hy3- Lassitude-Malaise

Hy4- Somatic complaints

Hy5- Inhibition of aggression

Pd1- Familial discord

Pd2- Authority problems

Pd3- Social Imperturbability

Pd4- Social alienation

Personality Assessment: 16 PF

- ▶ Primary factors-
 - ▶ Warmth (A)
 - ▶ Reasoning (B)
 - ▶ Vigilance (L)
 - ▶ Dominance (E)
 - ▶ Social Boldness (H)
 - ▶ Openness to Change (Q1)
 - ▶ Self-Reliance (Q2)
 - ▶ Perfectionism (Q3)
 - ▶ Tension (Q4)
- ▶ High on A, B, L > Low on E, H, Q



Personality Assessment: MBTI

- ▶ **Myers-Briggs Type Indicator (MBTI)**
- ▶ Identifies certain psychological differences according to the typological theories of Jung
- ▶ Considers personality type similar to handedness: individuals are either born with, or develop certain preferred ways of thinking and acting.

▶ **Dichotomies**

Extraversion	Introversion
Sensation	iNtuition
Thinking	Feeling
Judging	Perceiving



Personality Assessment: MBTI

Type Preferences & the 16 Personality Types		SENSING		INTUITING	
INTROVERSION	JUDGING	THINKING	FEELING	FEELING	THINKING
	PERCEIVING	ISTJ	ISFJ	INFJ	INTJ
EXTRAVERSION	PERCEIVING	ISTP	ISFP	INFP	INTP
	JUDGING	ESTP	ESFP	ENFP	ENTP
	PERCEIVING	ESTJ	ESFJ	ENFJ	ENTJ
	JUDGING	ESTP	ESFP	ENFP	ENTP





Personality Assessment: MBTI

Temperament & the 16 Personality Types		ABSTRACT		CONCRETE	
		DIRECTING	INFORMING	DIRECTING	INFORMING
AFFILIATIVE	RESPONDING	INFJ <i>IDEALIST</i>	INFP <i>IDEALIST</i>	ISTJ <i>GUARDIAN</i>	ISFJ <i>GUARDIAN</i>
	INITIATING	ENFJ <i>IDEALIST</i>	ENFP <i>IDEALIST</i>	ESTJ <i>GUARDIAN</i>	ESFJ <i>GUARDIAN</i>
PRAGMATIC	RESPONDING	INTJ <i>RATIONAL</i>	INTP <i>RATIONAL</i>	ISTP <i>ARTISAN</i>	ISFP <i>ARTISAN</i>
	INITIATING	ENTJ <i>RATIONAL</i>	ENTP <i>RATIONAL</i>	ESTP <i>ARTISAN</i>	ESFP <i>ARTISAN</i>



9:06 / 25:41





Personality Assessment: MBTI

Interaction Styles & the 16 Personality Types		DIRECTING		INFORMING	
RESPONDING	AFFILIATIVE	ABSTRACT INFJ CHART-THE-COURSE	CONCRETE ISTJ CHART-THE-COURSE	ABSTRACT INFP BEHIND-THE-SCENES	CONCRETE ISFJ BEHIND-THE-SCENES
	PRAGMATIC	INTJ CHART-THE-COURSE	ISTP CHART-THE-COURSE	INTP BEHIND-THE-SCENES	ISFP BEHIND-THE-SCENES
	AFFILIATIVE	ENFJ IN-CHARGE	ESTJ IN-CHARGE	ENFP GET-THINGS-GOING	ESFJ GET-THINGS-GOING
INITIATING	PRAGMATIC	ENTJ IN-CHARGE	ESTP IN-CHARGE	ENTP GET-THINGS-GOING	ESFP GET-THINGS-GOING

Personality Assessment: Big 5

25 items

STRONG ADJUSTMENT	Resilient	Responsive	Reactive	WEAK ADJUSTMENT
LOW SOCIABILITY	Introvert	Ambivert	Extrovert	HIGH SOCIABILITY
LOW OPENNESS	Preserver	Moderate	Explorer	HIGH OPENNESS
LOW AGREEABLENESS	Challenger	Negotiator	Adapter	HIGH AGREEABLENESS
LOW CONSCIENTIOUSNESS	Flexible	Balanced	Focused	HIGH CONSCIENTIOUSNESS

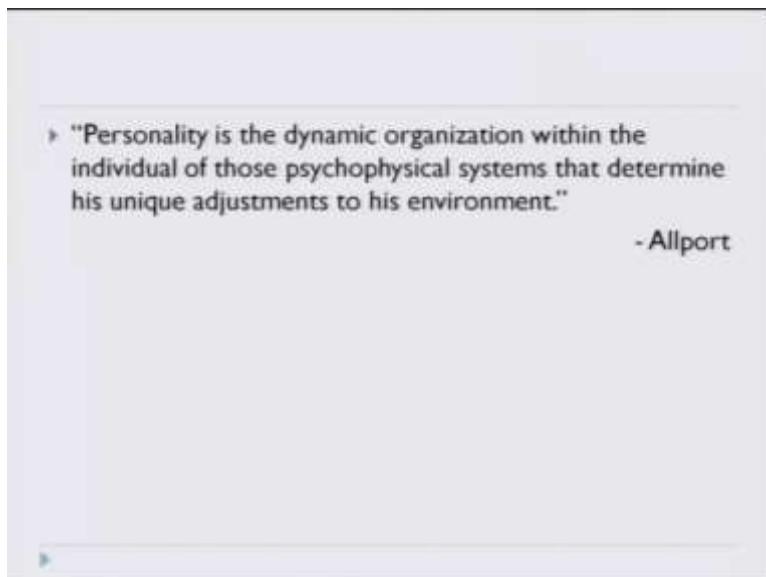


Introduction to Psychology
Prof. Braj Bhushan
Department of Humanities and Social Sciences
Indian Institute of Technology, Kanpur

Lecture - 34
Personality

Today we are going to start a fresh topic where in we would primarily be talking about what personality is. What are the measure approaches to on the standing of personality, and we will also come across what are the techniques used to assess personality of any individual. Common sensibly you must have found people always talking about personality of one person or the other, but given know the discussion on this very topic we would try to understand is it that what commonly people understand that this is what the person of the person is or when they generate a profile of somebody, is it really so scientific the way psychology describes it.

(Refer Slide Time: 01:09)



So coming to the definition of personality famous psychologist are put he defined personality as a dynamic organization within the individual which has psycho physical systems, which determine his or her unique adjustment to the environment. So, ideally how you respond to the environment in which you are in the psycho physical system and all these elements of the systems how dynamically they are organized and it is this dynamicity of the organization, which enables you to keep changing, to keep revising, to

keep adapting to the environment therefore, you would realize that there would be whole range of characteristics that you can suggest that this very individual, basically is characteristics 1 plus 2 plus 3 plus and the number of characteristics that you can draw, but you would perhaps never succeed saying that this very person basically means this one single characteristics that usually does not happen.

(Refer Slide Time: 02:20)

The slide has a light gray background with a dark gray border. At the top left, the word "Approaches" is written in a bold, black, sans-serif font. Below it is a horizontal line. To the right of the line, there is a bulleted list of four items, each preceded by a small black triangle symbol:

- ▶ Type & Trait Approaches
- ▶ Dynamic Approach
- ▶ Learning & Behavioural Approach
- ▶ Humanistic Approach

At the bottom left of the slide, there is a small blue navigation arrow pointing to the right.

So, to understand personality of any individual, we would understand the approaches taken by psychologists. Four major approaches if you wish you can make it five. Type and trait I am combining them as one single approach, many books you would find that type approach is now put separately and trait approach is put separately, for convenience I am putting type and trait approaches together the Dynamic approach, where in we would be talking about the psycho analyze, how they try to define personality. Learning and the Behavioural approach and finally, the Humanistic approach.

So, these four approaches we would take to understand personality and I must tell you that, we would be talking about type and trait approach in a much more succinct way. Especially when we come to the type approach, I will very clearly tell you that find these are the early propositions and these are the modern propositions and therefore each of this approach might not get same degree of time when we talk about it here.

(Refer Slide Time: 03:26)

Type Approach: Early

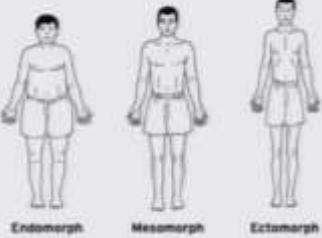
- Hippocrates (400 BC)
 - Sanguine Type- Cheerful, active, confident, etc.
 - Melancholic Type- Depressed
 - Choleric Type- Hot tempered
 - Phlegmatic Type- Calm, slow

Coming to the type approach the earliest now approach was what was proposed by Hippocrates 400 B.C. Where he said that find you can divide individuals into four groups, the Sanguine types, The melancholic types, The Choleric type and the Phlegmatic type and each of these types, he gave certain characteristics. He said that if somebody is sanguine type; that means, the individual would be cheerful, very active and confident. People who are melancholic type, they would largely be depressed. People who are choleric type would be hot tempered and people who are phlegmatic type would be calm and slow. Then came Sheldon classification and Sheldon basically looked at the physical make of the body and then he tried associating certain characteristics with those makes.

(Refer Slide Time: 04:07)

Type Approach: Early

- Sheldon's classification
 - Endomorph (short & plump)- Socialable, relaxed
 - Ectomorph (tall & thin)- Restrained, self-conscious
 - Mesomorph (Heavy & muscular)- Noisy, aggressive, & active



Endomorph Mesomorph Ectomorph

So, he divided people into three groups Endomorph, Ectomorph and the Mesomorph. Endomorphic are short and plump. Ectomorphic who are tall and thin, and Mesomorphic who are heavy and muscular and then he correlated now this type of a body makeup with certain characteristics wherein he said that those who are Endomorph means short and plump, they are largely very relax type of people and they are also very very social in nature. People who are Ectomorph mean they are tall and thin; they are being ones who would e restrained and very self conscious. Here is people who are mesomorphs heavy and muscular people, they would be noisy they would be aggressive, but they would also be very active in nature. Let me tell you that modern psychology when you look at the understanding of personality Sheldon's classification you will not find place for it.

(Refer Slide Time: 05:22)

Type Approach: Modern

- › Eysenck
 - › Extrovert & Introvert
 - › Stable & Neurotic
 - › Psychotic

But then most of the books of introduction psychology, if you look at it will talk about know these two type approaches, the early approaches. Much later the classification of Eysenck came into being where in Eysenck divided people on x y axis, which had 3 dimensions, Introversions, Extroversion, Stables and Neurotics and the Psychotics.

(Refer Slide Time: 05:32)

Type Approach: Modern

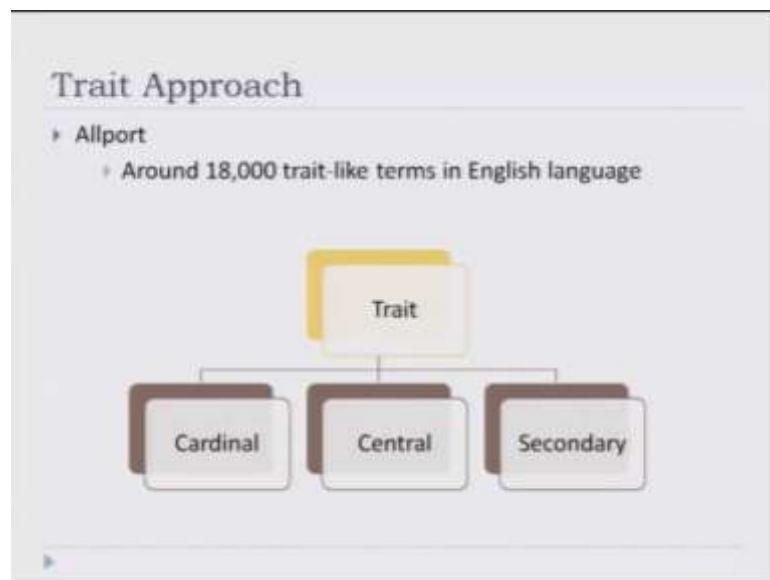
- › Myer Friedman & Ray Rosenman
 - › Type A (competitive, restless, high achieving, active, aggressive)
 - › Type B (opposite of type-A)

And then one more type approach in the modern time which came, that was of course, out of the practicing doctors, Friedman and Ray Rosenman, then they came forward with the concept of type A and B type of people and I must tell you that Rosenman and

Friedman basically their theory this type approach, came out of the patients who visited their clinic because of some cardiac problem.

They found those who are type A, they are basically the competitive people; they are also restless very high achieving active and aggressive in nature. And type b people who are just opposite to this. So, this 4, two old and two new you would find at this type of approaches to understanding individuals are classified as type approaches.

(Refer Slide Time: 06:22)



We now come to the trait approach. Allport once again we referred, to his definition right in the beginning. He looked at the English language and tried to find out those terms those words in English. Which now sounds like trait like type of A term and he founded there are 18000 different words which can be considered as traits and what he did was that he classified traits in to 3 groups, Cardinal Traits, Central Traits and Secondary Traits.

(Refer Slide Time: 07:00)

Trait Approach

› Allport

- › **Cardinal traits**- those which are so dominant that nearly all of the individual's actions can be traced back to them.
E.g., Gandhian, Machiavellian, etc.
- › **Central traits**- characterize one's behaviour to some extent but not in such a complete way as cardinal trait.
It's rare for an individual to have more than 10-12 such central traits.
- › **Secondary traits**- traits that are influential but only within a narrow range of situations.
- › All these three traits constitutes one's psychological life histories

So according to Allport, there are some traits which are Cardinal means they are so dominant that nearly you can trace back the individual to that specific type of a trait like say Gandhian, Machiavellian. So, Gandhian would mean now Gandhi like. So, one single trait or one small combination of traits which basically describes the full length of your personality those traits are called the Cardinal traits, then comes the central traits, these are basically now traits that characterize ones behavior to some extent, but not as complete as the Cardinal traits and it is rare for individuals to have more than 10 or 12 such central traits. So, you can imagine that if central traits are center of exploration of characteristics of a given individual and you can assume of at max tend to twelve central traits, then how many cardinal traits you can think of.

And the third category of traits according to Allport was the secondary traits - traits that are influential, but only within a narrow range of situation and all these three traits basically constitutes the psychological history of as human being.

(Refer Slide Time: 08:22)

The slide has a light gray background with a dark gray header bar. The title 'Trait Approach' is centered in the header. Below the title, there is a horizontal line. Underneath the line, there are two bullet points: '» Julian Rotter' and '» Single trait- LOCUS OF CONTROL'. At the bottom left of the slide, there is a small blue navigation arrow pointing to the left.

- » Julian Rotter
- » Single trait- LOCUS OF CONTROL

Then another new concept came in psychology given by Julian Rotter and Rotter basically focused on one single trait, where he talked about the locus of control and based on the locus of control, his idea was that people either have an inward locus of control or they have an outward locus of control and locus of control if you look at literature in psychology, we will find that this is one of the most widely studied topics in psychology where in people have found out that say management of a stress, tolerance of a stress, how one copes what could be the ramifications of a stress full scenario. All of these have been examined with respect to locus of control where people have found that external locus of control serves you better compare to the internal locus of control.

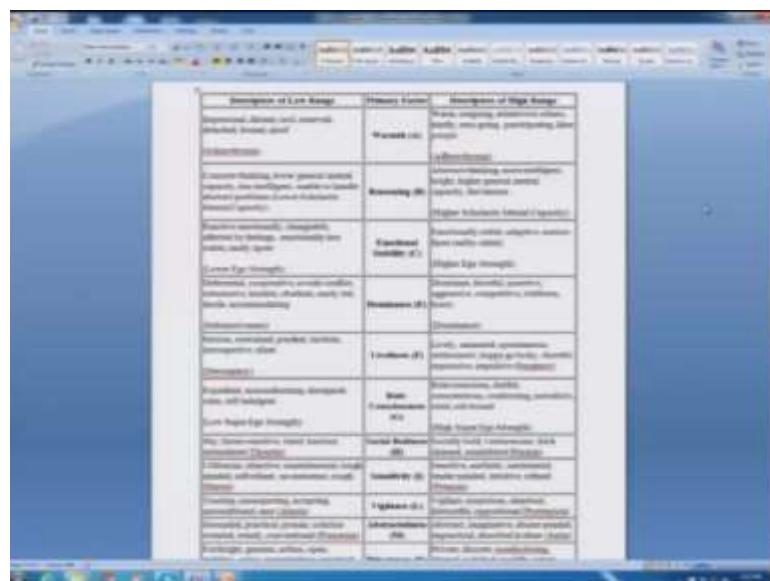
(Refer Slide Time: 09:18)

Trait Approach

- Cattell
 - 16 factors to describe personality

And of course, Cattell gave this is famous 16 factor personality and if you look at this whole set you would realize now that bi polar combinations have been talked about.

(Refer Slide Time: 09:30)



So, if you look at those 16 factors proposed by Cattell, look at your screen right now. You find the primary factors mentioned there and then you have to know the two extreme ends, One the low range and the other one is the high range. So, warmth, reasoning, emotional, stability, dominance, liveliness, rule consciousness, social boldness, sensitivity, vigilance, abstractness,私ateness, Apprehension, openness to

change, self reliance, perfectionism and tension. These are the 16 various factors that Cattell talks about and now Cattell gives complete description of, what type of people are who have who are either low on a particular now trait or those who are high on that.

(Refer Slide Time: 10:05)

The screenshot shows a Microsoft Word document window. At the top, there is a ribbon with tabs like 'Home', 'Insert', 'Page Layout', 'References', 'Mailings', 'Review', and 'View'. Below the ribbon, there is a toolbar with icons for 'Font', 'Font Size', 'Bold', 'Italic', etc. The main content area contains a table with 16 rows, each representing a personality factor. The columns are labeled 'Trait', 'Description', and 'Example'. The traits listed are:

Self-reliant, unemotional, independent, free of guilt, coolness, self-sufficient, unassimilated	Approaching (A)	Independent, self-relying, trusting, good process, leisure, easygoing, self-trusting, cool, impersonal
Controlled, directionless, leaderless, non-invasive, competing, traditional	Resistant-to-change (R)	Controlled, directionless, leaderless, non-invasive, competing, traditional, conservative, law-abiding, over-controlling, over-cautious, evaluations
Impulsive	Self-direction (S)	Impulsive, ordinary, unassimilated, non-invasive, self-reliant, cool, aloof, nonconformist
Independent, efficient, curious and bold, bold, dependent	Principled (P)	Independent, efficient, curious and bold, bold, dependent, cool, aloof, nonconformist, strict, moralistic, controlling, rule-keeping, control, control, and conformism
Competent, efficient, hard-working, sensible, sensible, unassimilated, modest, modest, cool, aloof, nonconformist	High-growth (G)	High-growth (G)
Cool, detached	Principled (P)	Principled, competent, efficient, hard-working, sensible, sensible, unassimilated, modest, modest, cool, aloof, nonconformist, strict, moralistic, controlling, rule-keeping, control, control, and conformism
Warm, sympathetic, kind, easy going, participating and you would like people	Low-growth (L)	Low-growth (L)
Detached, impersonal, distant, cool, reserved, detached, formal, aloof	Low-growth (L)	Low-growth (L)
These are the characteristics that you would reflect upon and then very nicely Cattel also says that if you are high on certain characteristics you are bound to be low on some other characteristics. So, he gives a very nice now mix and match of 16 different factors. Because we are succinctly going through these approach is therefore, we would not go through now all the 16 traits that he talks about and looking at the description.		

For instance he says that if you are high on warmth, then you would be warm outgoing, attentive to others, kind, easy going participating and you would like people. In case you are low on warmth, then impersonal, distant, cool, reserved, detached, formal, aloof these are the characteristics that you would reflect upon and then very nicely Cattel also says that if you are high on certain characteristics you are bound to be low on some other characteristics. So, he gives a very nice now mix and match of 16 different factors. Because we are succinctly going through these approach is therefore, we would not go through now all the 16 traits that he talks about and looking at the description.

(Refer Slide Time: 11:39)

The slide has a light gray background with a dark gray border. At the top, the title "Major Framework" is centered in a bold, dark font. Below the title, there is a list of four categories, each preceded by a small black triangle symbol:

- » Psychoanalytic
 - Freud
 - Erikson
 - Jung
 - Adler
- » Behaviourist
 - Skinner
 - Bandura
- » Humanistic
 - Maslow
 - Rogers
- » Indian concept

At the bottom left of the slide, there is a small black triangle symbol pointing downwards.

So, by and large if you look at the frame work now I have now removed the type in the trait approach four major frame work we would be looking at. We would be looking at the psychoanalytic frame work, where in we would talk about the proposition a Freud, Erikson, Jung, Adler and of course, Karen Horney. We would also look at the behaviorist framework. Primarily we would look at the work of Skinner and Bandura, how they are work describes the personality of a human beings. How can we use humanistic approach to understand personality? We would be borrowing the concept of Maslow and Rogers and then trying to understand this. After having discussed the 3 major frame work, which is adopted to understand Splints personality, we would also take the Indian concept ok.

The Indian concept of the Thriguna and trying to making mix and match that what actually suggests what type of situation in terms of personality.

(Refer Slide Time: 12:42)

Psychoanalytic

- » Sigmund Freud (Father)
- » Adler
- » Jung
- » Horneye
- » Erikson

So coming to psychoanalytic approach, Sigmund Freud we have been talking about him that he was considered as the father of Modern Psychology and was later on followed by Adler, Jung, Horneye and Erikson. We would look at all these theories, all these psychoanalyze. What type of explanation they have given, why people become the way they leave behave in their life. So, how is the psych determined?

(Refer Slide Time: 13:18)

Sigmund Freud

- » Topography of mind:
 - Conscious
 - Unconscious
 - Preconscious
- » Structures:
 - Id
 - Ego
 - Super ego

Sigmund feud basically talked about two important things. First he gave the Topography of mind, where in he talked about conscious, unconscious and the preconscious states.

And he gave his famous iceberg theory, nowhere he said that approximately 9/10th of our mental faculty remains unconscious to us. We are not aware to about it. Only one-tenth of our mental faculties are consciously available to us and he drew thin line between the unconscious and the conscious state where he said that state of precocious lies and he gave interesting examples. For instance he said that say if you have to extract the unconscious elements of an individual, it is something which is very difficult and he gave only two methods one of course was his method of hypnosis where you can hypnotize the other individual and extract the information from deep unconscious state. The second, Freud suggested that you can interpret the dreams of the individual and he I quote him he said that dreams are wild road to unconscious. Where in do his interpretation of the dream gives elaborate explanation has to how the content of the dream of an individual can be analyzed to extract the unconscious elements.

Conscious of course, you are consciously aware of something, but then he talks about a very interesting thing when he says that, some of the things passes from conscious and remain at the precocious level for some time and he very nicely expressed that there are processes like say slip of pen, slip of tongue, you intended to say something else you had twist of the tongue and you miss pronounced and said something else. Freud says that the twist of the tongue basically makes you say what was there in your preconscious state. Similarly if you have now slipped of the pen it reflects now what you inwardly think about that every situation.

So, he talked about this trifurcated Topography. The conscious, preconscious and the unconscious and later on he came forward with a trifurcated structure of the mind when he talked about the id ego and super ego.

(Refer Slide Time: 15:50)

Sigmund Freud

- » Topography of mind:
 - Conscious
 - Unconscious
 - Preconscious
- » Structures:
 - Id
 - Ego
 - Super ego

His idea was that these 3 things work on 3 separate principles. The Id works on the pressure principle, the ego works on reality principle and the super ego works on the morality principle. So, Freudian view was that, we all have certain now desire which are driven by immediate gratification demand. So, they constitute the Id because it works on pleasure principle. So, at times you become you know extremely demanding in terms of I like this, I want this, I would like to have it and he do not think of the ways and means through which you would like to satisfy it. It would simplify demand at find I want it and just I want it at nothing more than that. Once you receive it your pleased. So, that is how the pressure principle operates.

The super ego on the other hand it now gives moral governance to you. It works on morality principles. So, the values, the do and do not that you have learnt in your rearing practices though family, through society, through various agents, who have served no shipping your behavior. They tell you the doable's in the non d-ables. So the do's and the do not's of the society that you have learned, that are extremely important when it comes to now certain types of feelings like shame, guilt, whether it is immoral, whether it is moral and a stuffs like that the judgmental thing.

So, what happens in given situation you have a need your Id suggests you, that find you need it, you would love to have it, your super ego starts telling you whether it is good to have it, whether it is appropriate to have it, whether it is justify to have it, how correct

morally it is and so for. And it is the ego which works on the reality principle, which has the responsibility of , striking the balance between the Id and the super ego. Now what happens ego has the primary responsiblity of striking the balance. What Freudian analysis suggests is that you cannot keep on satisfying only the Id or only the Super ego. I am not venturing in to that area, but if you look at the whole story of psychoanalysis and explanation of areas types of clinical diagnosis. Over emphasis, over gratification of one of these three structures is going to cause severe problem.

And therefore, ego has to now remain in touch with the reality, ego also has to partially make up satisfaction equation it has to derive out of the demands of the id and the super ego, it has to strike a balance.

(Refer Slide Time: 19:03)

Sigmund Freud

- » Stages of Psycho-sexual Development:
 - Oral Stage (Birth – 2 years)
 - Anal Stage (2 – 3 years)
 - Phallic Stage (3 – 5 years)
 - Latency Stage (5 – 11 years)
 - Genital Stage (11-)
- » Important propositions:
 - Oedipus complex
 - Electra complex
 - Castration Anxiety

Then the most significant, controversial and of course, celebrated I would say, concept proposed by Freud was when he proposed a stages of psycho sexual development wherein he said, that entire human life can be split into five different stages. First worth to 2 years of age, what he called has Oral stage. 2 to 3 years of age what his theory says as Anal stage. Phallic stage was is the third stage which is from 3 to 5 years, Then comes Longer stage relatively 5 to 11 years of age. What for it calls has Latency stage and eleven onwards according to him is Genital stage.

Now, the first three stages of life, according to Freud are extremely crucial for now deciding the persona of the individual, means 0 to 5 years of age. Now according to him

we have erogenous zone in body which keeps shifting. So, in the oral stage the erogenous zone lies in the oral cavity therefore, between the age of 0 and 2 child usually prefers to know grasp and put things in the mouth because the maximum sensitivity can be drawn only out of erogenous zone, which is right now in the oral cavity.

Then two to three years of age which is basically the anal stage which is relatively shorter duration when the erogenous zone shifts to the anus and therefore, the child what it does is that either it tries to know retain the feces material or it has now it develops certain degree of fascination towards expulsion of the excreta and this is also this stage when toilet training is given to the child and it is the permissiveness the acceptance. At this very stage given by the care given mostly it would be mother in our context which makes the child understand how acceptable he or she is.

And then comes the third stage, the Phallic stage ,3 to 5 years of age when the erogenous zone now shifts to the private part and this is the time when the childhood would twists the private parts and what interestingly Freud says is that once you go to the latency stage, the erogenous zone disappears for certain number of years and this is how you will have to love to socialize, move out of the house, try to form groups and so forth we are not venturing in to latency and genital stage we would confined ourselves only to the first 3 stages here. So, in the Phallic stage he gave three important propositions, primarily, talking about 2 complexes the Oedipus complex and the electra complex.

Basically these two complexes represent the same phenomena. Deriving from the Greek mythological details, he said that child between the age of 3 and 5, develops extreme degree of love for the parent of the opposite sex. So, male child would develop love for the mother and the female child would develop that degree of attraction for the father. Male child having extreme fascination for mother, he named it Oedipus complex and female child developing extreme love and affection for father he named this to be Electra complex and he said that basically it is this Oedipus complex and the Electra complex, primarily representing the same thing means excessive attraction towards the parent of the opposite sex, he said that this plays a very important role in the phallic stage.

So, during phallic stage children they always are too passionate about the parent of the opposite sex, but by the end of the phallic stage, the child develops this ability, the child demonstrates this ability of partial withdrawal of this level affection and reinvestment in

to the other parent. So, as a male child, the child would withdraw part of the love and affection now invested in the mother and re-invest in the father. Usually according to Freudian analysis, usually this withdrawal and reinvestment is successful in most of the cases and he says that in case this reinvestment fails. These are now the primary routes for developing different type of sexual orientations.

Now, he talked about now penis envy and castration anxiety. Which he attached to depress complex basically he said that the male child having now maximum fascination for the mother realizes that there could be situation when he, private part could be castrated and this is source of anxiety according Freud. Similarly the parallel of construction anxiety in the girl child according to Freud was the penis envy where he said that the girl child is envied of the fact that she lacks the private part that now the male counterpart has. So, this is now description that was given by Sigmund Freud. Primarily talking more and more about the Id, ego and the super ego; the emphasis was on the unconscious part of the mind and then talking about the early life experiences. The Erogenous zones specially the first five years of life and saying that how important these were.

Today we would stop here. When we meet next we would be talking about the new Freudians, those who largely accepted the Freudian view point, but then added something more to it.

Introduction to Psychology
Prof. Braj Bhushan
Department of Humanities and Social Sciences
Indian Institute of Technology, Kanpur

Lecture – 35
Personality

Having talked about Sigmund Freud's proposition today we are going to begin with the concepts proposed by the Neo Freudians.

(Refer Slide Time: 00:26)

Alfred Adler

- › **Individual Psychology**
- › Important concepts:
 - › Mastery
 - › Power
 - › Superiority
 - › Status
- › **Inferiority Complex**  Compensation
- › Over compensation
- › Inferiority is innate & universal

So, let us first begin with Alfred Adler. Adler's proposition is named as individual psychology and the major concepts that he talked about were mastery power superiority and status things which human beings largely look for you want to master something you want to acquire more and more power you want to be extremely superior and you are very much conscious about your status, but then the major focus at Alfred Adler was putting was on inferiority complex and then he said that basically inferiority is something which is innate and universal.

So, all of us have certain degree of inferiority complex within us and he says that we adopt 2 types of mechanisms either we compensate for those inferiorities that we experience or sometimes we even go for over compensating them.

(Refer Slide Time: 01:23)

Alfred Adler

- ▶ **Inferiority Complex**
- ▶ striving for superiority & 'upward drive'
- ▶ **Masculine Protest**
- ▶ Striving to be stronger & powerful as a compensation for feeling of being inferior & unmanly.
- ▶ 1912- Replaced 'Masculine Protest' with Striving for superiority
- ▶ This was further replaced as striving for success or perfection.
- ▶ **Ordinal position of child**

And it is this inferiority complex he says which finally, makes us strive for superiority and upward drive. So, I realize my limitation I realize that I am inferior on certain parameters as compared to others and then, what I do I strive towards upward movement I try to overcome I compensate it and in that process, I become more and more superior, but I must tell you that this very superiority the concept that earlier talked about initially the termed he used was masculine protest and he said that striving to be stronger and powerful as a compensation for feeling of being inferior and unmanly is something that is what he defined as masculine protest.

In nineteen hundred and twelve he replaced masculine protest with the term striving for superiority and later on it was replaced as striving for success or perfection. So, he by and large supported the Freudian view point the addition that are made to this psychoanalytic approach was the concept of inferiority complex and the upward drive that individuals shows and overall trying to achieve mastery power superiority and status, in life another important concept that Adler talked about was the ordinal position of the child means what is the position in the birth order that your parents have whether you are the first child second child third child lone child and so forth.

(Refer Slide Time: 03:11)

Alfred Adler

► **Ordinal position of child**

- First-born- Gets undivided attention. Experience traumatic experience of dethronement when a new baby is born.
- Second-born- Are achievement oriented.
- Last-born- Are at risk of being problem child; Strong feeling of inferiority & lacks independence; highly motivated to surpass elder siblings; achievement oriented & competition minded.
- Lone child- Inflated self-concept & exaggerated sense of superiority; too dependent; lacks feeling of cooperation & social interest.

So, Adler said that if somebody is the First-Born- child he or she gets the undivided attention of both the parents. Now experience of traumatic experiences of dethronement when a new baby is born, you enjoyed the status as a first born baby you got undivided attention and then comes the second baby in life and this becomes a traumatic experience because you realize, that you are being removed from the status that you enjoyed if somebody is the second born child second child in the family then these children are more and more achievement oriented this is Adler's concept and if somebody is the last born child they are at risk of being problem children they have a strong feeling of inferiority and they lack independence they are highly motivated to surpass elder siblings achievement oriented and they are very, very competition minded according to Adler .

And interestingly Adler goes to the extent of explaining what happens if you are the only child in the family he says that these children have inflated self concept and exaggerated sense of superiority they become too dependent on their care givers they lack feeling of cooperation and they also lack social interest. So, I would summarize that say besides accepting the fact that there is something unconscious and the other prime proposition of psychoanalytic framework Adler's major concept was defining not the ordinal position of the child, but basically talking about the inferiority complex and how this compensation and over compensation of this very complex finally, leads to attainment of superior position.

(Refer Slide Time: 05:24)

Carl Gustav Jung

› Analytical Psychology

- **Complex:** A network of ideas bound together by a common emotion or set of feelings.
- **Collective unconscious:** Past experience of human race.
 - › Consists of primordial images that include memory traces of human past as well as our prehuman & animal ancestry.
 - › Many types of myths, legends, & religious beliefs are stored in collective unconscious.
 - › Complexes are individualized & constitute contents of personal unconscious.
 - › Archetypes are generalized & constitute contents of collective unconscious

Another psychoanalyst who gave major leap to the entire psychoanalytic framework was Carl Gustav Jung. Jung talked about the complexes and the proposition that he gave is called analytical psychology he said that complexes are basically network of ideas which are brought together by common set of emotions and feelings according to Jung collective unconscious basically has the past experience of the human race it consists of the primordial images that include memory traces of human past as well as the pre human and the animal ancestry that, we share he say that many types of myths legends and religious beliefs are stored in our collective unconscious and the complexes that we have are individualized and constitute content of personal unconscious and he did also talk about archetype and he said at archetypes are generalized and they constitute contents of collective unconscious.

So, basically one of the elements of unconscious he says that is the collective unconscious which primarily is something which, we have borrowed from our pre human stage and this is something that we all share our common past experience as a human race, but then Jung also talks about the personal unconscious.

(Refer Slide Time: 06:44).

Carl Gustav Jung

- › **Personal unconscious:** Develops out of any of the individual's conscious experiences that had been repressed.
- › Consists of repressed infantile memories, forgotten events or subliminally perceived experiences of a person.
- › It varies from person to person and is unique to the person concerned.
- › Contents of personal unconscious are called complex.
- › Word Association Test was developed to bring forth these complexes.
- › **Individuation:** Means by which each of us become distinct from each other.

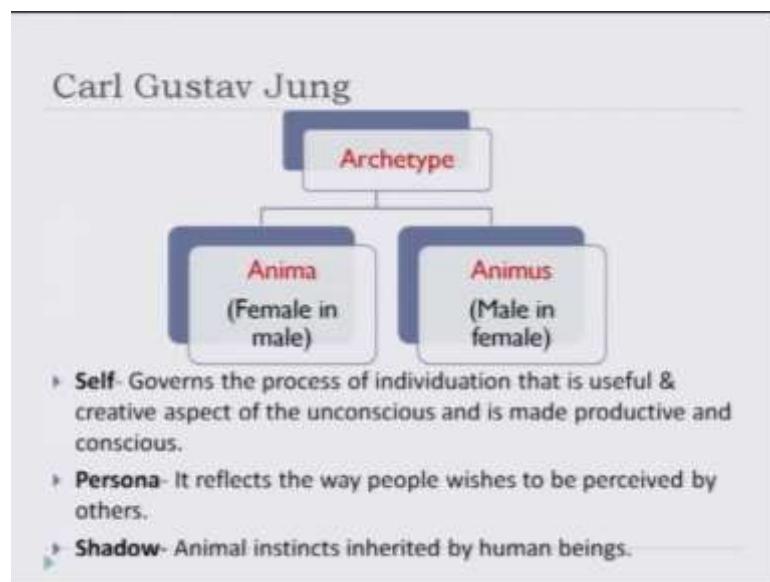
And he says that personal unconscious basically develops out of any of the individuals conscious experiences which he or she tries to repress in psychology you would find very nice explanation of the process of expression suppression and repression expression. Of course, is a free expression of what you feel within what you think of suppression is when you know what you think you know what you feel, but you do not overly express it then psychology will say that you are suppressing that very idea repression is a very interesting concept repression is the thought the feeling that you put a cap on right at the time of germination.

So, as an individual you yourself do not know what you visualize or what you feel about a given thing simply because you have put up black box in it over it. So, the repressed content is never known to the individual where as the suppressed contents we are aware of it. So, he talks about repression and he says that because it is unconscious therefore, the individual conscious experiences when it is repressed it adds to your unconscious because you have a repressed it therefore, it will not be consciously available to you now according to Jung personal unconscious basically consists of the repressed infantile memories forgotten events or subliminally perceived experiences and therefore, it varies from person to person and he is very unique to the individual concern why because our infantile experiences would be very, very different as a child I might have experience something else compared to you and what I and you have experienced as a child might be different from the third individual.

And because these are part of infantile memories it is not available to us, but it does haunt us according to Jung and therefore, variation in the infantile stage creates whole lot of repressed infantile memories then certain events that we have forgotten they constitute the unconscious element and then some type of experiences which we subliminally perceived means the full blown perception process did not take place and we experienced it. Now it goes to our unconscious state and because if you make a mix of the infantile state of memory the forgotten events and the subliminal experiences then this combination makes us too much varied from each other.

Then Jung says that the content of personal unconscious basically they are complexes and he In fact, the test the world association test that he developed was to bring forth these complexes then he talked about individuation the method by which each of us become very distinct from each other.

(Refer Slide Time: 10:03)



Then Jung talks about the archetype and 2 famous archetypes he talked about was the anima and the animus archetype besides that he talked about self persona and shadow as other archetypes. If you have female in the male body, physically one is male, but behaviorally you find a female in that male that is anima archetype where you find that somebody is female physically, but has what you think of Malely qualities then it is male in the female what you referred as Animus, Anima. Animus Archetype now is the most popular that you will find everywhere being talked about.

But he talked about 3 more archetypes the self which basically governs the process of individuation that is useful in creative aspect of the unconscious and is made of productive and conscious experiences he talked about persona which basically reflects the way the people wishes to be perceived by others and the shadow archetype which basically is the animal instinct inherited in all of us then came Erick Erickson his proposition is what is called as search for ego integrity.

(Refer Slide Time: 11:21)

Erick Erickson

- » **Search for ego integrity**
- » All stages (of psychosexual development) have both psychosexual as well as psychosocial aspects of growth & change
 - » Infancy (corresponds to oral stage): 1st year
 - » Early Childhood (corresponds to anal stage): 2-3 years
 - » Play age (corresponds to phallic stage): 4-6 years
 - » School Age (corresponds to latency stage): 6-11 years
 - » Adolescence (corresponds to fifth stage): 12/13-19 years
 - » Young Adulthood (roughly twenties)
 - » Middle Adulthood (30-60/ 65 years)
 - » Maturity (65 – death)

And if you remember Freud talked about 5 stages oral anal phallic latency and genital stage Erickson talked about the stages of development which is basically covalent to the psychosexual development, but he said that all stages have both psychosexual as well as psychosocial aspects of growth and change.

And he gave longer list he said that the first stage is the stage of infancy that is the first year now this corresponds to the oral stage given by Freud, but Freud's oral stage was 0 to 2 years where as Erickson says that infancy basically is of only one year then Erickson's second stage is the early childhood stage which is 2 to 3 years and this corresponds with the anal stage that Freud had proposed. But remember Freud's now anal stage was 2 to three, but 0 to 2 was the in oral stage now. So, there is little separation here in a sense that infancy has been given only one year where as 2 to 3 years the 2 is the year of longer period has been given to the anal stage of Freud and according to Erickson this is the early childhood period.

Then 4 to 6 years of age Freud stopped at 5 years. Now he said 3 to 5 was phallic stage for him, but Erickson says that 4 to 6 year what he called as play age then he says school age which basically corresponds to the latency is stage proposed by Freud which is 6 to 11 years of age. Then adolescence which corresponds to the fifth stage that is the genital stage 12 to 13 or 19 years of age. So, somewhere between 12 and 13 it starts goes up to nineteen and then according to Erickson the 3 stages which follows are young adulthood which is roughly twenties the middle adulthood which is 30 to 60, 65 years of age and then the maturity stage the last stages maturity the onset is 65 and it goes up to death of the individual.

(Refer Slide Time: 13:57)

Erick Erickson

- ▶ Search for ego integrity
- ▶ Identification with models
- ▶ Shifting goals & clarity of values

Now, besides talking about ego integrity the focus that Erickson also led was on identification with the model means how we identify models in our life and then we keep shifting our goals with attainment of more and more clarity in terms of values. So, this was an interesting thing and, if you want to know draw a parallel little later. When we come to the behaviorist approach there again we will be coming to imitation and shaping modeling. So, you would realize that there was a gradual shift from the neo Freudian approach to the other approach that was taken to explain personality of human beings then came Karen Horney. Karen Horney is now proposition is called the psychoanalytic interpersonal theory she talked about basic anxiety and basic hostility.

(Refer Slide Time: 14:45)

Karen Horney

- **Psychoanalytic Interpersonal Theory**
- **Basic anxiety:** Arises in childhood when the child feels helpless in a threatening world.
- **Basic hostility:** Usually accompanies basic anxiety and grows out of resentment over the parental behaviour that led to anxiety in the first place.
- **Three models of social behaviour:**
 1. Moving towards others- Excessive compliance
 2. Moving against others- Satisfaction through ascendance and dominance of others
 3. Moving away from others- Self protection by withdrawal

According to her basic anxiety arises in childhood when the child feels very, very helpless in this threatening world. So, the perception is the world is threatening the feeling is that I am helpless and this becomes source of anxiety for the child this is what she calls as basic anxiety, the second concept that she launched was the concept of basic hostility where she says that usually this is accompanied by basic anxiety and grows out of resentment over the parental behavior that led to anxiety in the first place means as a child you hold your parent responsible for making you helpless feel helpless in this threatening world and you resent to it.

So, when situation that made you anxious when you resent to it and you keep repeating your resentment you keep reflecting your resentment this is what Horney call that calls that this is basic hostility she talked about 3 models of social behavior where in one case you move towards others what she refers as excessive compliance, when you move against others what she say at this is satisfaction through ascendance and dominance of others and third she says moving away from others which she refers as this is self protection by the method of withdrawal.

(Refer Slide Time: 16:25)

Behaviourist: Dollard & Miller

- » Early social learning
 - » Attempted testing Freudian concept (Neurotic behaviour) in lab (on rats)
 - » Translated concepts of psychoanalysis into learning theories

So, this was all about the psychoanalytic approach to understanding of human personality we would now be coming to the other very, very dominant school of thought the behaviorist thought.

And we would initially talk about Dollard and Miller and then we will come to the skinnerian approach and finally, we would be talking about Alberts Banduras, model Dollard and Miller's view point is what is called as the early social learning approach basically they attempted testing the Freudian concept of neurotic behavior in lab on rats.

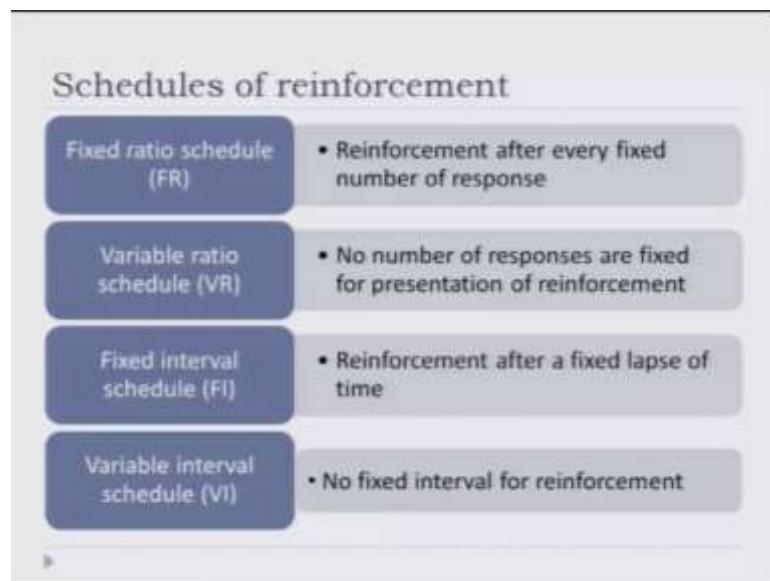
(Refer Slide Time: 17:18)

Behaviourist: B.F. Skinner

- » Operant conditioning
- » Reinforcement

And finally, they translated the concept of psychoanalysis into learning theories that is the reason why we are referring to this here, but the major, understanding of personality of individual came out of the proposition of B.F. Skinner we have gone through his proposition in at length. When we are going through learning he talked about operant conditioning talking about reinforcement and he also talked about the schedule of reinforcement when we talked about fixed ration variable ratio fixed interval and variable interval schedules.

(Refer Slide Time: 17:45)



Just to recapitulate what we discussed when, we are talking about learning and reinforcement fixed ratio schedule basically means that reinforcement is given after every fixed number of responses in variable ratio schedule no number of response are fixed for presentation of the reinforcement in fixed interval schedule reinforcement is given after lapse of certain time. So, it has not to do with a number of response rather it has a do with the time lag and then the last was the variable interval schedule where there is no fixed interval for reinforcement. Now if you try to map it to our life experiences those experiences in our life that act as reinforcement to us those life experiences which basically induces a sense of aversion in us and how frequently did they get repeated were our response in that very situation reinforced you can very easily map your early life experiences on these schedules of reinforcement.

And you can then think that why is it that I got conditioned to respond to given set of things in life in a very, very particular way now skinner's view point of operant conditioning of course, after rat and pigeons he demonstrated operant conditioning in human babies as well, but think of your own life experiences and think of the reinforcement that you got in life think of the aversions you received in your life. So, both positive and negative type of scenarios that you experienced and the situations wherein you responded and the type of response that you got positive and negative feedback from the environment you can map it very nicely to the schedule of reinforcement and then you can think that. In fact, you start repeating only those behavior which you realize, were reinforced by the environment behavior which was not reinforced by the environment you actually started curtailing on that you reduced reflecting such type of responses in life.

(Refer Slide Time: 20:24)

Behaviourist: B.F. Skinner

- Shaping: The behaviour of the organism is gradually shaped or molded through a series of successive approximations by selectively reinforcing certain responses and not reinforcing the others.
- Superstitious behaviour is developed due to accidental reinforcement.
The subject acts as though certain response produced reinforcement whereas the reality is that there is no necessary connection between that response and reinforcement.
The response is commonly followed by reinforcement merely due to the fact that both response and reinforcement occur frequently.

But the most important thing that Skinner talks about which can very easily be mapped to development of persona is shaping, the behavior of the organism is gradually shaped it is molded through the process of successive approximation. So, we have selectively reinforcements in our life certain responses are reinforced certain responses are not reinforced we follow the pattern of successive approximation and gradually we are molded we are shaped and what shape finally, we take is what you can call that this is our personality. Now for example, now you can take examples of superstitious behavior when it develops due to accidental reinforcement.

(Refer Slide Time: 21:00)

Behaviourist: B.F. Skinner

- › **Shaping** (the method of successive approximations)

Initially vaguely reinforcing a behaviour according to one's desire

Once established, search for variations that come little closer to what one wanted, until the respondent shows a behaviour ordinarily not seen in normal circumstances.

- › **Behaviour modification**

- › Design culture such that good gets rewarded and bad extinguishes

Now initially what happens that there are certain vaguely reinforced type of behavior which is given to some persons, say for instance if you are parents, if you are care givers they were vaguely reinforcing your behavior according to what they thought you should be.

And then what happens that once you establish that type of a behavior because of this reinforcement you search for variation that would come very closer to what you wanted and this is what gives you a very unique touch and of course, skinner also talked about behavior modification. Now behavior modification and shaping these 2 concepts if you match it basically, what would happen that you can think of designing culture which would automatically reward good things and the bad elements in the society will gradually get distinguished. So, today we talked about the behaviorist view point we could not talk about Albert Banduras proposition of modeling. So, when we meet next we would be talking about one important behaviorists model given by albert bandura we would be talking about how modeling plays an important role in our life.

Key words - analytical psychology, archetype, ego integrity, behaviourist, schedules of reinforcement, inferiority complex

Introduction to Psychology
Prof. Braj Bhushan
Department of Humanities and Social Sciences
Indian Institute of Technology, Kanpur

Lecture - 36
Behaviourist and Humanistic Perspective

Now, that we have discussed behaviorist view point, how they try to explain personality let us now talk about the preposition of Albert Bandura.

(Refer Slide Time: 00:23)

Behaviourist: Albert Bandura

Modelling

- Most of our learning is acquired through observation or modelling
- We observe others performing behaviours and retain those behaviours for further use

Process governing modelling:

- **Attention** (For modelling, it is essential that we must attend to the behaviour of other persons)
- **Retention** (The observed patterns of behaviour must be symbolically retained)
- **Motor production** (Conversion of cognitive representations into appropriate actions)
- **Motivation**

Bandura is very famous of his modelling concept. According to him most of our learning is acquired through observation or modelling. So, what we do in our life is as a growing child we select a model, we pick and choose certain replicatory behavior of the model, and then we start imitating it. Therefore, what happens that we would now basically observe the performance, we would retain some of the observed behavior and then we try to replicate it. Usually what happens in a socially context. the elder members of the family, the society, they also appreciate, they do pass remarks which gives a positive feed to the growing child that he or she has been successful modelling whose favor he or she is trying to imitate. So, this was major concept proposed by Albert Bandura and

according to him there are four processes which govern the process of modelling; - attention, retention, motor production and motivation.

So, for modelling it is essential that we must attend to the behavior of the other person. So, this is the attention component. So, you exclusively pay attention to the model whom you have selected from your environment. Second, you observe the pattern of behavior that you are model exhibits and you basically try retaining the now symbolic image that you generate out of it. So, this is the retention part, you pay attention to your model, you very keenly observes certain key features and then you try to retain it. Third, when you start converting whatever you have retained the symbolic retention you start converting it into some cognitive representations into appropriate actions. So, the manifested behavior is somehow now coming closer to the symbol that you had you know retained and this is how attention which helps you retain and retention when you succeed converting into overproduction which is the motor production part and then of course, there is motive behind that and this governs the entire process of modelling.

Bandura also proposed two determinants of learning, the antecedent determinants and the consequent determinants.

(Refer Slide Time: 03:02)

Behaviourist: Albert Bandura

Determinants of learning:

- Antecedent determinants: Activates the person and guides behaviour
- Consequent determinants: Maintains behaviour after being activated

Major factors in consequent determinants:

- **External reinforcement:** obtained through direct experience
E.g., money, praise, reward, punishment
- **Vicarious reinforcement:** based upon vicarious experience
E.g., learning through observation of consequences of others behaviour
- **Self produced reinforcement:** Every person sets some standards for themselves & behave accordingly. In such situation they don't need any external reinforcement to maintain their behaviour

According to him, antecedent determinants, they activate the person and guide the behavior of the given individual whereas consequent determinants basically they maintain behavior after it has been triggered, after it has been activated and there are of course, certain reinforcements that one gets, it could be external in nature, it could be vicarious in nature or there could even be an option of self produced reinforcements. External reinforcements basically they are obtained through direct experiences, as i was referring right now know, that the people in your family the people in your society, they praise you they appreciate you that you have been able to replicate the behavior of your model. So, this is a praise, this is external reinforcement, you receive certain reward in some other formats or for doing certain things you receive a punishment. So, reward and punishment would be known that two sides of the same process of praise or the negative consequence of it. It could be materialistic in nature it could be say you are being offered money as an award. So, all these constitute external reinforcement.

Vicarious reinforcement they are basically based on our vicarious experiences, for example, learning through observation of consequences of others behavior. So, you do not have an experience, direct experience rather you know that somebody else tried doing this and got positively or negatively rewarded by the community or other stakeholders in the society in the family. And therefore, what you do you learn from the consequence that the other person experience. Say for instance you realize that responding in a particular way in a classroom or active participation in a classroom or usage of slangs is something that is not appreciated. So, certain doable aspects, certain non doable aspects, you have not used it yourself, but you have seen that others who use slangs were punished. You saw that others who actively participated in the classroom sections were rewarded and it is this reward and punishment that you have seen others receiving which in turn provides a reinforcement to you this is vicarious reinforcement.

There could be a third situation where there is self produced reinforcement. Every individual is likely to set some standards for himself or herself and once you set the standard for yourself you start behaving accordingly. Now in such situations you do not need any external reinforcements to maintain behavior, why? Because you are trying to achieve the target, therefore, you do not need reinforcement, your own process of

matching with the standard template that you have set for yourself is fair enough for the maintenance of the behavior.

(Refer Slide Time: 06:20)

Behaviourist: Albert Bandura

- › Reciprocal determinism- Environment causes behaviour and behaviour causes environment as well
- › Personality as an interaction among environment, behaviour and the person's psychological processes

Another concept proposed by him was of reciprocal determinism, Bandura said that environment causes behavior and behavior in turn also needs to the creation of certain type of environment. And personality is basically an interaction among environment, behavior and person's psychological processes. So, this was Bandura's view point, what we have seen we have looked at the Freudian and new Freudian view point. We have seen the behaviorist view point and now we come to the humanistic view point. We would talk about two important individuals and the concepts that they proposed, one Abraham Maslow and the other one is Carl Rogers.

(Refer Slide Time: 07:05)



Abraham Maslow's theory is also called self actualization theory. What he said was that human motives are basically innate and they are arranged in an ascending order of priority. So, there is a hierarchy of our need, if you look at your screen there is a pyramidal shape, at the bottom you have physiological needs, then comes the need for safety, need for belongingness, self esteem and finally, is the stage of self actualization. Physiological needs basically include hunger, thirst, sex and sleep. These are the four physiological needs.

Now these are the needs which work in cyclic order. So, you satisfy the need. You were thirsty, you have a glass of water after sometime once again the thirst will reappear. Once again you will have to go for gratification of it. Same with all types of physiological needs, but then you realize that once to certain extent you have been able to satisfy your physiological needs, the need for safety arises. You want to ensure that you are safe, you are secure and it is not only that you only you are secured as an individual, but your belongings and those associated with you, they also are safe and secure.

Once need for safety is secure to a certain extent, there is a need for belongingness need for affiliation. You want that people should like you and at the same time you also develop liking for a set of people this is the need for belongingness and thereafter comes

the need for self esteem. Now what Maslow did was, he basically divided these 5 stages into 2 broad categories, the B Motives and the D Motives.

(Refer Slide Time: 09:07)



Now the d motives are basically deficiency based motives whereas, the b motives or self actualization which stand alone in the category is basically the Meta needs. Now deficiency motive basically means that you are able to satisfy to certain extent, but then you realize that there is reappearance of that reignite. So, D motives are basically now based on the deficiency paradigm you satisfy the need and then, you realize that you have to redo it because, whatever you have attained does not last long whereas, b motive the self actualization is not like that which is based on Metaneeds. Little later we will look at exhaustive list of Metaneeds.

(Refer Slide Time: 10:15)

Humanistic: Abraham Maslow

D motives

- These are essentially survival needs
- Even love and esteem are instrumental in the maintenance of health
- These needs are genetically, like instincts
- He calls them instinctoid (instinct-like)

Two interesting things Abraham Maslow proposed and basically he said that see these D Motives they are essential for our survival they are basically your survival needs even the need to satisfy your physiological needs, safety, security, belongingness, all of them they serve the purpose of survival, even need for revelation, love and esteem both are instrumental maintaining your mental health and as well as your physical health. So, they all serve the survival function now all these needs are basically genetic the D Motives are genetic they are like instincts and. In fact, Abraham Maslow went to the extent of using a word instinctoid instinct, like this is what he meant by this word.

(Refer Slide Time: 11:56)

Humanistic: Abraham Maslow

- To self actualize means to reach the peak of one's potential so that one becomes a fully functional person
- Need for self actualization is an umbrella need that covers 17 metaneeds/ being values
- Metaneeds have no hierarchy and are equally potent
E.g., need for perfection, wholeness, richness, beauty, etc.
- Self actualization is not an all-or-none process, rather is a matter of degree
- No human beings are perfectly self actualized
- Esteem needs of Maslow are similar to Adler's "striving for superiority" and Erikson's "need for mastery"

Now, self actualization which is basically a b motive is basically a state which means to reach the peak of the potential that you have. So, that you become a completely fully functional individual. Now need for self actualization is basically an umbrella that covers seventeen different Metaneeds or the being values what Maslow says. Metaneeds have no hierarchy unlike the B needs, which were arranged in hierarchy and therefore, all Metaneeds are equally potent. For example, need for perfection, need for beauty, need for richness, wholeness, now all these needs they are equally potent you cannot arrange them in priority and self actualization is therefore, is not all or none process rather it is a matter of degree. So, you are perfect to what degree, it is not that either you are perfect or you are not perfect, that is not true in the case of self actualization, the b needs.

Whereas, in the case of d needs you are either you know you have a given physiological state say. For example, you are thirsty or you are not thirsty, but then in the case of Metaneeds, in the case of the being values self actualization you realize that all of them are equally important and the rather only vary in terms of their degree and of course, on the of the humbling preposition was that no human being is actually perfectly self actualized. Now the concept of esteem that was proposed by Maslow is similar to what Adler said as striving for superiority or what Erikson said as need for mastery there is a resemblance. So, the dynamic approach to personality which was talking about a striving

for superiority or need for mastery of course, proposed by Adler and Ericksons respectively it is similar to the concept of need for esteem self esteem proposed by Maslow.

(Refer Slide Time: 13:19)

Humanistic: Abraham Maslow	
Truth	Dishonesty
Goodness	Evil
Beauty	Ugliness or vulgarity
Unity, wholeness, and transcendence of opposites	Arbitrariness or forced choices
Aliveness	Mechanization of life
Uniqueness	Bland uniformity
Perfection and necessity	Sloppiness, inconsistency
Completion:	Incompleteness:
Justice and order	Injustice and lawlessness
Simplicity	Unnecessary complexity
Richness	Environmental impoverishment
Effortlessness	Strain
Playfulness	Grim, humorless
Self-sufficiency	Dependency
Meaningfulness	Meaninglessness

Now, here you find the list of Metaneeds on the left hand side you see the desirable Metaneeds. Whereas at the same time you try to achieve the desirable thing you also try to avoid the now characteristics the Metaneeds which are now penned down on the right side of the screen, say like you consider truth to be worthy characteristics, you would like to remain truthful you honor it, you respect it, you would like to have that in you, but at the same time you would also like to be away from dishonesty you would like to goodness in you, but at the same time you will try your best not to be able. So, likewise the left and the right panels basically are allow the two ends of the spectrum of a given and these Metaneeds basically if you look at them they are you know extremely positively oriented now truth goodness beauty unity wholeness and transcendence of opposites, aliveness, uniqueness, perfection and necessity, completion, justice and order simplicity, richness, effortlessness, playfulness, self sufficiency, meaningfulness, all of them are positively toned and therefore, when you try achieving these Metaneeds it is the degree to which you are able to sustain them.

So, how truthful are you, that would be know the basically interpretation of these Metaneeds and while you are trying to maintain certain degree of truthness in you, you ensure that you are not going to be dishonest likewise now the lower level needs that is now the D needs which are more of physiological oriented and safety oriented needs.

(Refer Slide Time: 15:16)

Humanistic: Abraham Maslow

- Lower level needs (physiological & safety) must be satisfied before higher level needs become motivator of behaviour
- Physiological needs are cyclic needs
- Physiological needs can be wholly satisfied. This is not true in case of other higher needs
- Safety needs can also be wholly satisfied
- Under stressful conditions, or when survival is threatened, we can "regress" to a lower need

According to Maslow, they are supposed to be satisfied before the higher lever needs they become activated. So, you satisfy the physiological needs, you come to the need for safety security, then you come to belongingness then, you come to self esteem and once you are able to take care of the D needs then you move to the B needs.

Now all these physiological needs they actually are cyclic in nature and therefore, physiological needs cannot be completely satisfied. This is not true in the case of self esteem and safety need of course, can be completely satisfied, but what happens, there is an interesting phenomena that you find also being described in dynamic approach. Maslow says that under stressful condition or when our survival is threatened, at that time we all regress to our lower needs. So, suddenly you realize that in the state of threat to survival or extremely stressful condition, people start worrying about their physiological needs need for security belongingness and so forth.

(Refer Slide Time: 16:44)



Now, Maslow says that the satisfaction of self esteem needs produced feelings like self confidence capability strength worth etcetera and when self esteem needs are thwarted then it leads to feelings of inferiority, helplessness, weakness and of course, we strive for need for strength, competence, self confidence, independence, mastery, prestige, fame dominance, dignity and appreciation now all of them you would find being referred either you go for the trade approach whether you go for the dynamic approach.

Even when you go for the behavioristic approach then you come to humanistic approach you would realize that irrespective of the approach that efferent psychologist have taken out this school of thoughts have know taken a line of action in terms of defining, why the personality of individuals get shaped in a particular way by and large the human characteristics does not change they remain the same. The process of acquisition why human beings how do they acquire, why do they reflect these type of characteristics the approach adopted by different schools of thought are little different, but by and large they talk of similar qualities of human beings.

We now come to Carl Rogers the second will appreciated person in the school of thought of humanism Carl Rogers the propagation is called self theory.

(Refer Slide Time: 18:11)

Humanistic: Carl Rogers

Self Theory / Person-centered Theory

- Based upon his experiences as a client-centered therapist
- Organism refers to a totality of experiences going on within the whole individual at a particular moment
- Organism is the locus of all experiences
- The totality of experiences constitute both conscious and unconscious experiences
- Phenomenal field/ Perceptual field consists of totality of experiences
- Experiences of phenomenal field are inner experiences; the sources may either be external, internal, or both

Person centered theory and this primarily is because it is based on his experience as a client centered therapist he gets the credit for introducing this new method of therapeutic intervention. Now Roger basically now talks about the organism which is the at most importance in his approach and with organism, he refers to the totality of experience going within that very individual in a particular movement. So, organism is basically the locus of all experiences, that Roger talks about and the totality of experience constitutes both, conscious as well as the unconscious experiences, he does talk about the perceptual field or the phenomenal field and he says that this very field consists of the totality of the experience of that very organism individual and according to Roger's experiences of phenomenal field are inner experiences and the sources may either be internal external or it could be both.

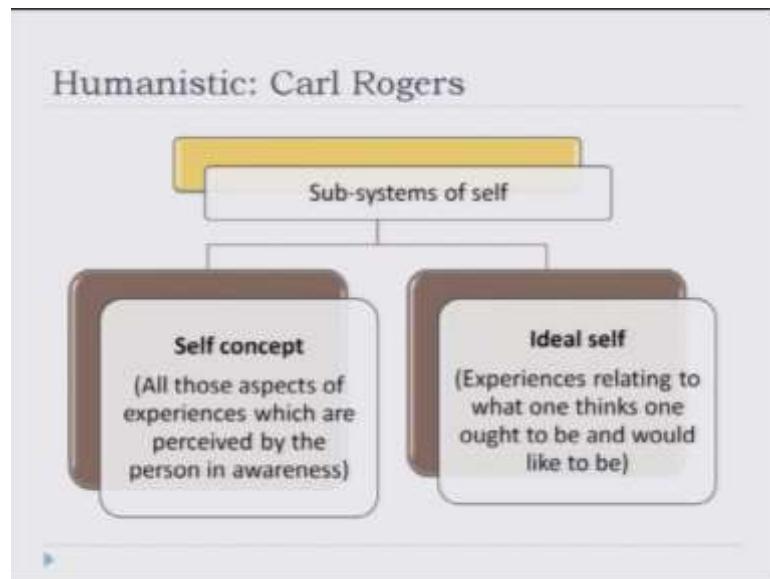
(Refer Slide Time: 19:19)

Humanistic: Carl Rogers

- Self emerges from the totality of experiences
- Self is a fluid, changing gestalt
- Self may be either in awareness or out of awareness
- With the development of self, the infant begins to understand good or bad as well as it tries to evaluate its experiences as positive or negative
- Self is not a separate dimension of personality (as stated by Freud)
- An individual does not possess a self, rather self incorporates the whole organism

Now, self has emerged as something which is a byproduct of totality of experience which is fluid, changing gestalt. So, self may be either in awareness or it could be out of awareness according to Roger s and with the development of self the growing child the infant begins to understand the good and the bad as well as he or she tries to evaluate its experience as positive or negative. So, Roger says that self is not now separate dimension of personality and the concept of self in the dynamic view point, in the dynamic approach, what the way Freud proposed it, Roger takes a different stand unlike Freud in view point says that self cannot be separated as a independent dimension of personality an individual does not possess a self where as self incorporates the whole organism.

(Refer Slide Time: 20:24)



Roger s also talks about now, two sub systems of the self the self concept and the ideal self. Now all the aspects of experiences which are perceived by the person know in awareness that constitutes the self concept where as ideal self basically is the experiences related to what one thinks one ought to be or one would like to be. So, you have the concept of the self, which is based on experience, your awareness your perception whereas, what you would like to be that constitutes your ideal self.

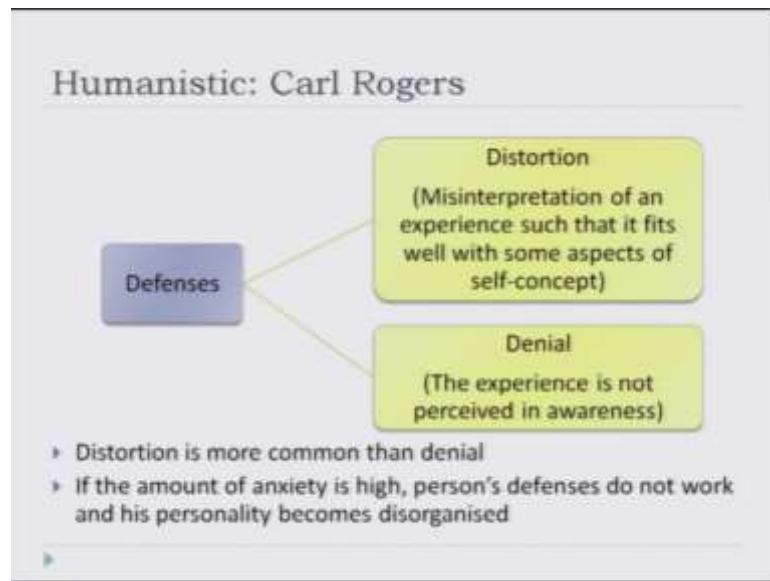
(Refer Slide Time: 21:11)

Humanistic: Carl Rogers

- Once the self-concept is formed, change and further learning becomes difficult
- Those experiences which are inconsistent with the self-concept are either distorted or denied by the individual
- Self concept is different from real self / organismic self
- Self concept is limited to only those experiences which we are aware of
- Organismic self may also include those experiences which are beyond our awareness

Now, once the self concept is formed according to Rogers, changes and further learning becomes difficult. So, those experiences which are inconsistent with the self concept. They are either denied by the individual or they are distorted and self concept is therefore, is different from the real self or the organismic self. It is limited to only those experiences which one is aware of and therefore, organismic self may also include those experiences which are beyond our awareness.

(Refer Slide Time: 21:45).



Now, he talked about the distortion and denial and distortion and denial basically are you the two types of defenses one would use. Now distortion would be a case when one misinterprets an experience so as to fit it well into some aspects of self concept So, you have self concept with you there is an experience and then you misinterpret it this is not the actual interpretation and therefore, it gets distorted.

Denial is another format of defense where the experience is not perceived in awareness at all and distortion of course, it is realized is much more common as compared to denial. So, human beings generously use distortion of the facts of their experiences rather than complete denial of it and if the amount of anxiety is high, person's defense do not work and his or her personality becomes disorganized.

(Refer Slide Time: 22:47)

Humanistic: Carl Rogers

- The concept of ideal-self is basically equivalent to the concept of super-ego
- Ideal-self contains all those attributes or characteristics that one aspires to possess
- A wider gap between the ideal self and the perceived self indicates incongruence and psychologically unhealthy personality

Now, the concept of ideal self is basically equivalent to the concept of super ego that Freud has proposed ideal self contains all those attributes or characteristics that one aspires to possess and the wider is the gap between ideal self and the perceived self, it indicates in congruency and psychologically unhealthy personality. So, you see that Carl Rogers view point no can even help you understand the healthiest side personality as well as the pathological side of the personality.

(Refer Slide Time: 23:25)

Humanistic: Carl Rogers

- » Every person has an inherent tendency to actualize his/her unique potential
- » Self-actualization is a growth force that is a part of person's heredity
- » Self-actualization includes biological potentials, but also involves a psychological growth and a moving towards maintaining and enhancing the organism
- » Self-actualization gradually develops from simple to complex.
- » Self-actualization is a dynamic force
- » Basic needs related to self-actualization:
 - Need for positive regards of others
 - Need for self-regard

According to Roger s every person has an inherent tendency to actualize himself based on the unique potential they have and self actualization is a growth force that is part of our heredity. Self actualization includes biological potential, but also involves psychological growth and a moving towards maintaining and enhancing the organism. It gradually develops from simple to complex state and is a dynamic force within us and according to Rogers the basic needs that relates to self actualization are the need for positive regards of others and the need for self regard. So, you need to regard others as well as you also need to be regarded. So, these are interesting concepts given by the humanistic school of thought.

(Refer Slide Time: 24:16)

Western Perspective

- First force- Freudian
- Second force- Behaviorism
- Third force- Humanism, including the European existentialism
- Fourth force- Transpersonal psychology
- Cue from Eastern philosophies to investigate things like meditation, higher levels of consciousness, and even parapsychological phenomena

Overall if you look at the western perspective you have find four different forces, first force which is the Freudian force, second force which is the behaviorist force, third force which is humanism including the European existentialism and the forth force is a transpersonal psychology. So, these four forces from the western perspective would realize they have heavily influence psychology as far as personality is concerned, but what you would realize is that the forth force has taken cues from eastern philosophy and they have tried to investigate things, like meditation, higher levels of consciousness and even certain parapsychological phenomena.

So, with this we conclude our discussion on the western perspective, but we would definitely like to also talk about the Indian perspective that we would be taking up in the next lecture.

Introduction to Psychology
Prof. Braj Bhushan
Department of Humanities and Social Sciences
Indian Institute of Technology, Kanpur

Lecture - 37
Indian Perspective of Personality and Assessment of Personality

In our attempt to understand personality we looked at various approaches the western perspective and towards the end of the previous lecture we also looked at the four different forces.

(Refer Slide Time: 00:35)

Western Perspective

- ▶ First force- Freudian
- ▶ Second force- Behaviorism
- ▶ Third force- Humanism, including the European existentialism
- ▶ Fourth force- Transpersonal psychology
- ▶ Cue from Eastern philosophies to investigate things like meditation, higher levels of consciousness, and even parapsychological phenomena

The first one was the dynamic approach the Freudian approach the behavioristic approach was the second one humanistic approach was the third one and the fourth force was transpersonal and we also discussed there see transpersonal psychology also took cues they borrowed certain concepts from the eastern philosophy and the concept of meditation the concept of consciousness certain parapsychological phenomena. They are basically the rich wealth of the eastern philosophy and it did provide cue to people in the west who are engaging in themselves in transpersonal psychology.

We are not going to talk about various types of eastern philosophy, but we would be talking about the Indian concept of personality especially you would realize that in are Indian tradition personality.

(Refer Slide Time: 01:26)

Indian Concept of Personality

- Distinctive psychological characteristics of person (personality)—
- Svabhava (typical)
- Prakriti (human nature)
- Fundamental attributes of prakriti— triguna

```
graph TD; Triguna[Triguna] --> Sattvic[Sattvic guna]; Triguna --> Rajasic[Rajasic guna]; Triguna --> Tamasic[Tamasic guna]
```

What is considered as the distinct characteristics of the person the words which represent them are either Svabhava or Prakriti. So, Svabhava would be that typical characteristics of the individual and the human nature is what is called the Prakriti the fundamental attribute of Prakriti is TriGuna which has three elements the Sattvic Guna the Rajasic Guna and the Tamasic Guna.

(Refer Slide Time: 01:56)

Indian Concept of Personality

- Sattvic guna- root meaning of sattvic is 'to be'
- being good, pure, devoted, tolerant, mental equilibrium, mental control, intelligence, knowledge and determination
- Rajasic guna- root meaning of rajasic is 'to be dyed'
- emotions, passions, pain, restlessness, drive, desire and envy
- Tamasic guna- root meaning of tamasic 'gasping for breath'
- indifference, uncertainty, misunderstanding, elusion, inertia, fear, arrogance, helplessness, mental imbalance and inactivity

- Murthy and Kumar (2007)

And all these Gunas have different roots they have been interpreted differently and the deliberation that I am going to make here is based on the work of Murthy and Kumar of two thousand and seven.

Now, they say that Sattvic Guna basically the root meaning is to be. So, being good being pure devoted tolerant having a state of mental equilibrium mental control intelligence knowledge and determination Rajasic Guna the root meaning is to be dyed. So, it would have emotions passion pain restlessness drive desire and envy the Tamasic Guna the root meaning of Tamasic is gasping for breath. So, characteristics like indifference uncertainty misunderstanding elusion inertia fear arrogance helplessness mental imbalance and inactivity they constitute the Tamasic Guna. So, our Indian tradition says that Sattvic Rajasic and the Tamasic Gunas they constitute the Triguna tri means three and they are actually the fundamental attribute of Prakriti .

(Refer Slide Time: 03:24)

Indian Concept of Personality

- Sattvic guna- Refers to goodness, harmony and essence
- Rajasic guna- Refers to passion, mobility and energy
- Tamasic guna- Refers to dullness, indifference and inertia
- **Prakriti (personality) comprise of**
 - temperament
 - mental make-up
 - interaction patterns of the individual

Now, Sattvic Guna basically refers to goodness harmony or essence the Rajasic Guna it refers to passion mobility and energy and Tamasic Guna refers to dullness indifference and inertia. So, the Prakriti of the individual the personality of the individual comprises of temperament mental makeup and interaction pattern of the individual.

(Refer Slide Time: 03:51)

Indian Concept of Personality

- ▶ Gunas constantly influence each other; when one dominates, the others automatically recede.
- ▶ The 'changing' nature of the gunas is because they reflect both states and traits

- Paranjpe (2004)

Now, Paranjpe says that Gunas basically they constantly influence each other when one dominates the other one automatically recedes. So, there is a nice equilibrium that they maintain between themselves. So, if one goes up the other will go down and. So, forth and the changing nature of the Gunas is because they reflect both the state and the trait remember when we were talking about the state trait theory personality has been taken as trait factor that we discussed right in the type and trait approach and then in psychology you will find whole lot of description of the state. So, as of now you are in water state that is the state component and there is something that is all ready in built in you that is your trait component Paranjpe argues that the Gunas they have both of it the trait part as well as the state part now this is an interesting component ,there is an overlap and slight distinction between the Indian concept and the western concept.

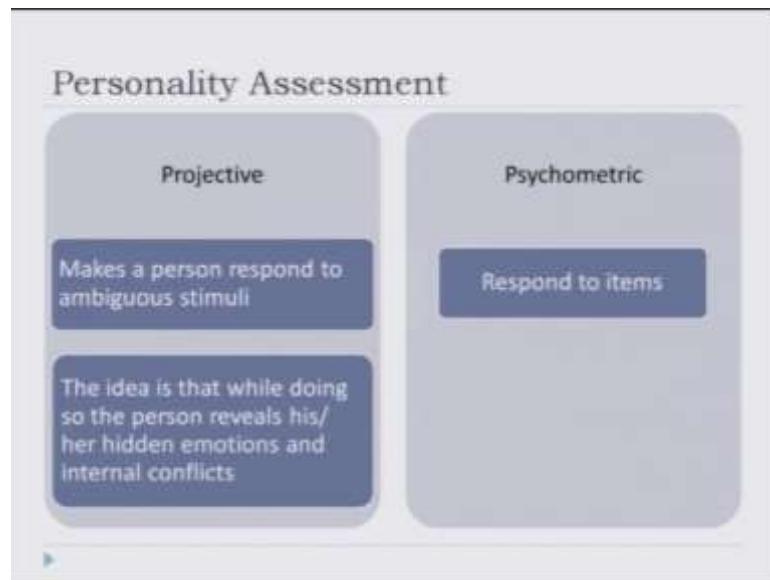
(Refer Slide Time: 05:06)



Having talked about personality and different adopting various approaches to understand how personality evolves.

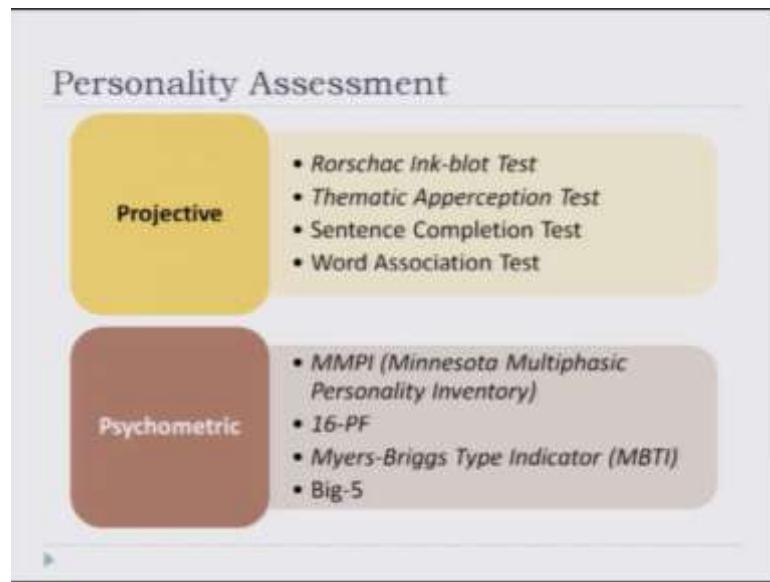
Now, we would concentrate on psychological assessment which has to do with assessment of the personality now when we were going through major milestones I said that see assessment has always been a very, very integral very, very strong component in psychology and therefore, assessment of personality is also being something which has flourished like anything till date it is on massive usage. So, when you look at the assessment strategies that are adopted by psychologist two broad categories you will find the projective techniques and the psychometric techniques. Now psychometric techniques what happens you use some inventories questionnaire some schedules. So, previously when we talked about curtails 16pf basically there were, 16 different personality factors and for each of these personality factors you would have certain number of items the questions to which the individual responds. So, psychometric technique basically adopts these tools questionnaire inventories and schedules and you respond to those items and accordingly your scoring is done and your personality is a sketched.

(Refer Slide Time: 06:28)



On the other hand we have a very rich technique what is called as a projective technique where you are presented with an ambiguous stimuli and as a person you are supposed to interpret that basic ambiguous stimuli and you respond to it the idea is that while you look at the ambiguous stimuli you basically reveal your hidden emotions and internal conflicts because it is ambiguous therefore, you do not realize that it is basically your own inner conflicts and the hidden emotions that are getting reflected rather, you think as if you were making an intellectual attempt to decipher the ambiguity the major projective tools the Rorschach ink blot test thematic apperception test sentence completion test word association test.

(Refer Slide Time: 07:27)



These are the projective tool the famous psychometric tools there are many I am taking very few here the famous MMPI minnesota multiphasic personality inventory sixteen pf we have talked about it earlier we will again talk about it the MBTI the Myers Briggs type indicator and the big 5 what we will do is will start with projective test and one by one we will go through the details of each of these test what actually they are what they intend to do and finally, what is outcome that you achieve out of them.

So, let us first come to ink blot test Rorschac he came forward with this very test and it is a very interesting type of it is for certain intellectual property issues.

(Refer Slide Time: 08:17)

Personality Assessment: Ink-blot Test

- There are ten symmetric inkblots- five in black ink on white paper & two in black and red ink on white paper. Three are multicolored.
- Subjects have to describe what he/ she perceives on the card. They are encouraged to narrate exhaustive details.
- After the individual has seen and responded to all the inkblots, the subject is asked to state where he/she sees what he/she originally saw and what makes it look like that.
- The blot can also be rotated.
- It is second most widely test used worldwide.
- Employed for diagnosing underlying thought disorder and to differentiate psychotic from nonpsychotic thinking in cases where the patient is reluctant to openly admit to psychotic thinking.

I am not showing you the card, but basically if you visit your lab and look at the card basically you have a card like this on the two sides you have a bilaterally symmetrical type of a blot. So, there are blots ink blots and these blots are bilaterally symmetrical. So, the left side in the right side would be exactly symmetrical. So, what Hermann Rorschach did he came forward with ten symmetric inkblots five of them in black ink on white background two in black and red ink on white background and then remaining three are multi colored in this case the requirement is at the participants has to describe what he or she perceives on the card. So, when you look at the card you have to say what it looks like and as the person who administers the test you encourage the participant to narrate more and more exhaustive details I remember one thing that you also have to allow the participant to rotate the card there could be a possibility, now that you present the card then the individual things rotating it clockwise anticlockwise that completely upside-down to decipher what is there in the blot. So, that is allowed.

And after the individual has seen and responded to all the blots the participant is then asked to state where exactly he or she was looking at originally and what actually look like what he or she is explained. So, initially you allow free movement of the card free rotation of the card encourage the participant is exhaustively explain what he or she sees their perceives there in the card and then once the session is over you say that now, tell me where exactly you are looking at an why this appeared what actually in the blot appeared whatever you have explained remember the this is the second most widely used

test worldwide this test know is heavily employed for diagnosing underlying thought disorders and different type of psychotic and non psychotic thinking especially in the cases when the patients are reluctant to openly admit that they have certain psychotic thought processes.

(Refer Slide Time: 10:49)

Personality Assessment: TAT

Henry A. Murray

- 31 picture cards
- The test can be administered individually, to groups, or self-administered
- Individuals can respond orally or in writing
- Cards include specific subsets for boys, girls, men, and women - 31 picture cards/2 series of 10 cards for boys, girls, men and women
- Can be administered to 10 years and older individuals
- They are supposed to stimulate stories or descriptions about relationships or social situations and can help identify dominant drives, emotions, sentiments, conflicts and complexes.

So, one of the extremely popular test in psychology the inkblot test the second test again heavily used in psychology very, very popular is TAT thematic apperception test now thematic apperception test was developed by Henry Murray and what Murray did was he came forward with thirty one cards thirty of these cards have sketches one card is blank now the beauty of the test is that it can be administered individually or you can administer it in a group setup or you can even self administer this test as well and you have the freedom you can respond orally you can respond in writing now, what this card has it has certain a specific subsets 10 cards are exclusively for men ten cards exclusively for women ten cards which are used for both and one is a blank card. So, that would mean that practically when you used TAT you would be using only twenty cards and twenty plus one basically one is the blank one.

And it can be administered to anybody who is ten years of age or above now what happens here you show the card and you ask the individual to narrate story to construct and narrate a story. So, the individuals are supposed to think of a story describe about the relationships social situations and these situation the descriptions the relationships that is

described in these stories they can help the psychologists identify the dominant drives of the individual emotions sentiments conflicts and complexes.

So, actually you are looking at the characters depicted on the card and although you tend to construct a story you weave a story in and around the character that you see on the card, but because it is ambiguous not. So, clear what exactly takes place and remember also one thing TAT requires that you should tell what actually is happening there it is a static thing, but then you have to because your constructing a story it will be a dynamic type of a thing. So, you will have to say what actually is happening what happened immediately before this and what would happen immediately after this. So, present immediate fast immediate consequence. So, these are the things that one is supposed to describe in the story and therefore, the significant drives of the individual complexes of the individual you derive out of the stories that one constructs.

(Refer Slide Time: 13:51)

Personality Assessment: TAT

- Completion time is variable
- Two basic approaches to interpreting responses to TAT cards- *nomothetic* and *idiographic*.
- Nomothetic interpretation: Practice of establishing norms for answers from subjects in specific age, gender, racial, or educational level groups and then measuring a given subject's responses against those norms
- Idiographic interpretation: Evaluating the unique features of the subject's view of the world and relationships
- Most psychologists prefer idiographic than nomothetic interpretation

Now, the completion time is variable and there are two basic approaches that psychologists take in terms of interpreting the responses to TAT cards the nomothetic approach and the idiographic approach in the nomothetic interpretation the practice of establishing norms for answers for subjects of specific age gender race or educational level is taken into account. So, what happens unlike the other types of this is psychology or.

In fact, I should say that like most of the test in psychology where you have you the normative interpretation. So, the original test is conducted on a large number of individuals then you try to converge on certain norms.norms which are specifically designed for specific age group specific racial group specific cultural group and likewise and then when the individual. who is now made to undergo that very test, his or her individual score is compared against the norm group norm that one has come forward with that is the possibility in the case of TAT. So, that is the nomothetic approach where you already know that this in this age boys of this very culture belonging to this very days largely they construct such types of stories. So, you have a what you call collective images that people construct and then you map the individuals story over the collective story content and then you interpret it that is nomothetic approach.

The other is the idiographic approach where evaluation is done looking at the unique features of the world and the relationship that the individual concerned takes now. If you overall look at now the strategy adopted by various psychologists in terms of interpreting TAT cards you would realize that maturity goes for idiographic interpretation people do not go for nomothetic interpretation I can share with you that many organizations worldwide including our own country TAT is used as tool to make the personality profile of the prospective employee of that very firm for certain reasons I cannot disclose you the name of those in situation, where TAT are used, but I must tell you that it is used and you would realize the beauty of it if you see it personally you know that how meticulously the profile of the prospective employees is sketched and accordingly the organization decides whether this type of people are wanted in this type of an organization are not.

Now, in TAT for interpretation purpose the focus is laid on basically three areas the content of the story the feeling or tone of the story.

(Refer Slide Time: 17:01)

Personality Assessment: TAT

- For interpretation focus is laid on three areas:-
 - content of the stories
 - feeling or tone of the stories
 - subject's behaviors apart from responses
- Verbal remarks as well as nonverbal actions or signs are considered while making interpretation
- It reveals -
 - Attitudes
 - Fantasies
 - Inner conflicts
 - View of the outside world
 - Assumptions about the world
 - Optimism or pessimism

And the behavior of the subject apart from the response and very interestingly the verbal remarks as well as nonverbal actions or signs are also considered when one makes interpretation and at the end of, the interpretation finally, the psychologist should be able to tell attitude fantasies inner conflicts the view of the outside world assumptions about the world and the level of optimism or pessimism in the person who has undergone the test.

(Refer Slide Time: 17:32)

Personality Assessment: Sentence Completion

- The technique was first used as an intelligence test by Hermann von Ebbinghaus in 1897
- The subject is presented with a series of partial sentences and is asked to complete them in his/ her own words.
 - *I only wish I had.....*
 - *My greatest fear is*
 - What burns me up is
- Rotter Incomplete Sentences Blank is one of the used versions of SCT

The third type of projective test again very popularly used is the sentence completion test now this very test was first used as an intelligence test by ebbinghaus in eighteen ninety seven in this case what happens part of a sentence is shown to the individual and then he or she asked to complete it for instance I only wish I had dot, dot, dot, dot my greatest fear is dot, dot, dot, dot. what happens that you read it and say if I say what my greatest fear is it would be different compare to when, you read what your greatest fear is and you respond to it. So, there would be whole lot of difference in terms of the responses that various individuals would elicit when it comes to sentence completion and again you can very easily sketch the personality profile of the individual based on the scores on the sentence completion test.

(Refer Slide Time: 18:39)

Personality Assessment: WAT

- ▶ 100 words to identify abnormal patterns of response
- ▶ Used as a means to identify psychological complexes, along with "intellectual and emotional deficiencies".

- Jung

Now, Rotter's incomplete sentence blank is one of the widely used versions of sentence completion test and one of the again popular test proposed by Jung was WAT word association test. Now what Jung did was he identified hundred words which basically identify abnormal patterns of responses.

In word association test the primary requirement is that the person who conducts the test will pronounce a word and you have to immediately come forward with the response word. So, my words say if I call it if I am running administering the test and you are the respondent. So, the word that I pronounce is the stimulus word and the word that you respond back to me is the response word. So, I say sun and you use moon. So, that time

lag the time difference between my pronouncement of word and your response that time is calculated. So, the time taken to respond is taken into account one two how many responses did you give you or free to give more than one response.

So, the whole set of responses that you give is taken into account and hundred words will be spoken by the psychologist one by one and you have to come forward immediately with the response word based on the responses certain classifications are made say for instance I say sun and you say moon now sun moon are type of matches which are categorized in a different way, but say I say sun and you say river you say house you take you use any other non conventional word. So, there are ways and means of classifying the responses and based on these responses then the psychologist tries to identify the complexes and Jung says that along with psychological complexes you can find out the intellectual and the emotional deficiency of the individual based on word association test. In fact, you would find the adaptation of w a t in the Indian, context if I remember correctly you will have the Indian version of w a t by Joshi.

Another interesting projective test is the situation reaction test in situation reaction test what happens you are given a situation where in there could be multiple ways of responding to it say for instance if you are given a situation like you are on your way to your office there was emergency call from your boss he needs you to be immediately come to the office while you are on your way you saw that on one side of the road there was an accident a couple has been badly injured what would you do. So, this type of complex situations would be presented to you and then there could be multiple ways of responding to it one way could be that my boss is given an emergency call to me I will rush to the office the other could be that I will rush to the office, but mean while I will just dial one zero zero for the police to come an attend to the case third could be that I would stop and ask others also for a help the fourth could be that I will stop and take these people to hospital.

So, situation remains the same, but the possibility of the response varies in situation reaction test you will find two formats the wildly used format is when the situation is return it is presented to you read think and then you respond in the recent time you would find little change in that the situation reaction test the video version of the test have been created even in our own country I myself have created one video based situation reaction test, but for reasons I will not the details of it basically what happens that when you read

you get time to think and you even re think over what you have thoughts. So, meta thinking is also possible there you want the true response to come and therefore, when you go for a video based situation reaction test you look at a video which is of a very short duration and you immediately respond to that very situation.

So, this re thinking your own thoughts that is taken care of to a much greater extent and therefore, your true responses likely to come forward and in situation reaction test especially you will find people in the uniform services arm forces police forces different type of elite services situation reaction test is one of the popular test used worldwide for these type of people. So, this was the whole area of personality assessment using the projective techniques in the next round when we meet in the next lecture we will be talking about the psychometric tools that are used for the assessment of personality.

Key words- indian concept of personality, guna, prakriti, personality assessment, projective, psychometric, ink blot, tat, sentence completion, wat

Introduction to Psychology
Prof. Braj Bhushan
Department of Humanities and Social Sciences
Indian Institute of Technology, Kanpur

Lecture – 38
Personality

Today we would be talking about the psychometric tools that are used for assessment of personality. Before we go in to the details as I told you right in the beginning that we would be taking only three four different types of psychometric tools, I must tell you that there are large number of tools available for assessment of personality, I am talking about the psychometrics once.

But gradually you would realize that if you look at the older versions of the personality assessment tools ,they had large number of items compare to the test which I have developed much later where you would realize that of the number of items for these tests have reduced. This is an interesting development. The first personality assessment tool under the psychometric tool category, that we are going to discuss is the Minnesota Multiphasic Personality Inventory; MMPI.

(Refer Slide Time: 01:15)

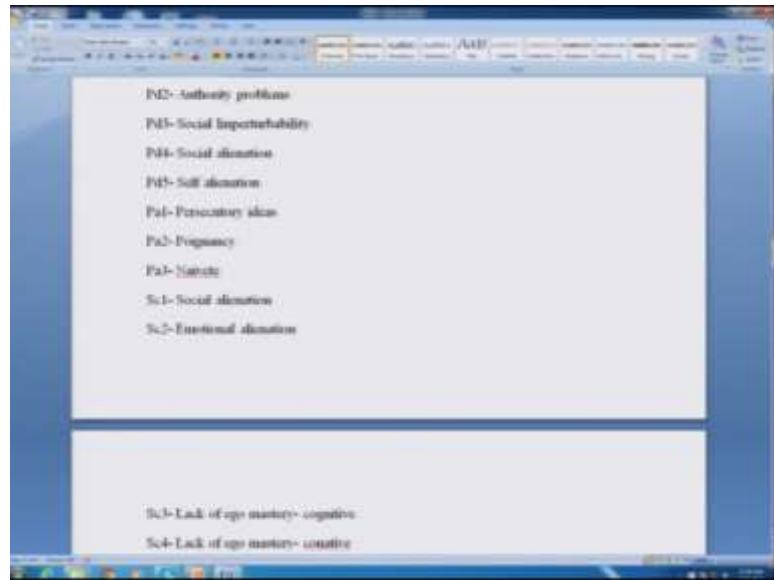
- Personality Assessment: MMPI**

 - › **MMPI (Minnesota Multiphasic Personality Inventory)**
 - › Hathaway & McKinley (1940, 51)
 - › 556 "true/ false/ ?" items
 - › 14 scales- 10 clinical scales, 4 supplementary validity scales

This was very popular test and till that in certain areas again you will find very heavily being used. Hathaway and Mckinley they came forward this very test which has 556 items which are basically true false or not sure type of responses format. So, either you

take true or you take false or you take not sure. And this has 14 scales, 10 clinical scales and 4 supplementary validity scales. Two versions have come MMPI one and recently you will find MMPI two being used.

(Refer Slide Time: 01:55)



Now look at your screen the clinical subscales that MMPI measures are hypochondriasis, depression, conversion hysteria, psychopathic deviates, masculinity femininity, paranoia, schizophrenia, hypomania, social introversion. It also measures subjective depression, psychomotor retardation, physical malfunctioning, mental dullness, brooding, and denial of social anxiety, need for affection. Whole lot of characteristics you will find that is very test tries to find out.

You would realize a very interesting thing that in a certain high state professions, say for in some example I can share with you in at least in the west, those who use to go to the nuclear power plants the operators there, they were suppose to undergo in MMPI and unless you have certain score you will not be qualified to become a nuclear part plant operator. So, important was this test that one point in time and even today in certain areas we would find MMPI being used.

The other important test in a psychology for assessment of personality we have referred to this is 16 PF.

(Refer Slide Time: 03:22)

Personality Assessment: 16 PF

- Primary factors-
- Warmth (A)
- Reasoning (B)
- Vigilance (L)
- Dominance (E)
- Social Boldness (H)
- Openness to Change (Q1)
- Self-Reliance (Q2)
- Perfectionism (Q3)
- Tension (Q4)
- High on A, B, L > Low on E, H, Q

Now 16 PF are different 16 personality factors, but the primary factors that this test talks about are warmth, reasoning, vigilance, dominance, social boldness, openness to change, self-reliance, perfectionism, tension and so; 16 difference factors. And you can see in the bracket know A B L E this is the code that just it provides, so these codes are given.

Now, what happens in this case of 16 PF we you get the items, you respond to them and then you are assessed. What is interesting in this very assessment is that if you are high on certain qualities you are supposed to be low on other qualities. So, I have chosen only those factors where one of the concepts in this very test is given of high and low. Like if you are high on A B and L that is warmth, reasoning and vigilance then you are bound to be low on E H and Q. E is dominance, H is social boldness and Q are basically openness to change, self reliance, perfectionism and tension.

So, 16 PF creates an interesting type of situation where you have 16 different characteristics and then your assessed on the basis of what are you high act and what are you low at.

The third and extensively used personality assessment tool is MBTI.

(Refer Slide Time: 05:01)

Personality Assessment: MBTI

› **Myers-Briggs Type Indicator (MBTI)**

- › Identifies certain psychological differences according to the typological theories of Jung
- › Considers personality type similar to handedness: individuals are either born with, or develop certain preferred ways of thinking and acting.

› **Dichotomies**

Extraversion	Introversion
Sensation	iNTuition
Thinking	Feeling
Judging	Perceiving

Now, Myers-Briggs Type Indicator or you can even take this test online. It identifies certain psychological differences according to the typological theories of Jung. Right now we when we were talking about word association test in the projective domain they are also be referred to Jung, and then this is the psychometric tool which is again based on the typological theory given by (Refer Time: 05:31).

Now, this considers personality type similar to handedness. So, what happens in the case of handedness? You are born with certain type of ability or you develop certain preferences. So what happens, that you develop certain preferred way of thinking. And acting and based on that it has developed very nice parameters of finding what type of combinations you have. So, this MBTI talks about certain dichotomies like introversion, extraversion, sensation, intuition, thinking, feeling and judging and perceiving.

(Refer Slide Time: 06:12)

Type Preferences & the 16 Personality Types		SENSING		INTUITING		
INTROVERSION	JUDGING	ISTJ	ISFJ	INFJ	INTJ	
	PERCEIVING	ISTP	ISFP	INFP	INTP	
	EXTRAVERSION	ESTP	ESFP	ENFP	ENTP	
EXTRAVERSION		JUDGING	ESTJ	ESFJ	ENFJ	
		PERCEIVING	ESTP	ESFP	ENTJ	

Now, it says that if you are looking at type preferences and the 16 personality types it comes out of it. Look at sensing intuiting the columns there, so you could be sensing thinking, you could be sensing feeling type of person, you could be intuiting feeling person or you could be intuiting thinking person. And similarly you will have introversion, extraversion. Now you see here extra introversion, extroversion was the first dichotomy and the second dichotomy was sensation intuition

So, now you have sensation, intuition divided into thinking and feeling for both and then introversion extraversion again divided in terms of judging and perceiving type, thinking, feeling, judging, and perceiving all these four dichotomies, so it is a 4 by 4 matrix that is created in MBTI. Now look at the type preference. So, the first possibilities ISTJ; I stands for introversion, S stands for sensing, T stands for thinking and J stands for judging. So, you have a combination of introversion who is sensing type, thinking and judging type. This is the type reference. The second is ISFJ. So, you are now introvert sensing, feeling, judging type. The third INFJ, so you can make out now it is intuiting, introversion, intuiting feeling and judging. And then the fourth one is INTJ where you have introversion, intuition, thinking and judging.

So, the first row if you see it gives you four outcomes. So, 4 and then you have another 4 so 8, and again 4 and again 4 so 4 4s are finally it comes to 16. So, 16 different type of

personality types you can come out of MBTI when it when you are looking only for the type preference.

Similarly, say if I go to perceiving type then you will have introverts who is sensing, thinking, perceiving type. Then you have introverts, sensing, feeling, perceiving type. Introverts who are intuitive, feeling, perceiving type; introverts who are intuitive thinking and perceiving type. Similarly you have extroverts who are sensing, thinking, and perceiving type.

So, these are 16 different types of personality types that you can now come forward with.

(Refer Slide Time: 09:01)

Temperament & the 16 Personality Types		ABSTRACT		CONCRETE	
		DIRECTING	INFORMING	DIRECTING	INFORMING
AFFILIATIVE	RESPONDING	INFJ IDEALIST	INFP IDEALIST	ISTJ GUARDIAN	ISFJ GUARDIAN
	INITIATING	ENFJ IDEALIST	ENFP IDEALIST	ESTJ GUARDIAN	ESFJ GUARDIAN
PRAGMATIC	RESPONDING	INTJ RATIONAL	INTP RATIONAL	ISTP ARTISAN	ISFP ARTISAN
	INITIATING	ENTJ RATIONAL	ENTP RATIONAL	ESTP ARTISAN	ESFP ARTISAN

Then you can look at the temperament. In temperament again you have affiliative and pragmatic on one hand Affiliative have two components responding and initiating, and same which pragmatic you could be responding and initiating type, Abstract and concrete type. Abstract is now both of them are directing and informing type.

So, again do this same exercise as we did in the previous case. So, you again come forward with 16 different types of temperaments. First one would be affiliative, abstract, responding, and informing; this is one. And what you would realize is that say again you come forward with 16 different types of combinations and then there are words written there, idealist, guardian, rational, artisans, so these are the brought temperaments. But within the same temperament you would realize that you have variation.

For instance, idealist if you see there are four different types of idealists; affiliative, responding, abstract, directing; then affiliative, responding, abstract, informing. Affiliative, initiating, abstract, directing and affiliative, initiating, abstract, informing, like vise 4-4 combinations are there. So, idealist 4 different types, guardian's 4 different types, rational 4 difference types and artisans again 4 difference types.

(Refer Slide Time: 10:53)

Interaction Styles & the 16 Personality Types		DIRECTING		INFORMING	
		ABSTRACT	CONCRETE	ABSTRACT	CONCRETE
RESPONDING	AFFILIATIVE	INFJ CHART-THE-COURSE	ISTJ CHART-THE-COURSE	INFP BEHIND-THE-SCENES	ISFJ BEHIND-THE-SCENES
	PRAGMATIC	INTJ CHART-THE-COURSE	ISTP CHART-THE-COURSE	INTP BEHIND-THE-SCENES	ISFP BEHIND-THE-SCENES
INITIATING	AFFILIATIVE	ENFJ IN-CHARGE	ESTJ IN-CHARGE	ENFP GET-THINGS-GOING	ESFJ GET-THINGS-GOING
	PRAGMATIC	ENTJ IN-CHARGE	ESTP IN-CHARGE	ENTP GET-THINGS-GOING	ESFP GET-THINGS-GOING

And then you can also look at the interaction style based on their MBTI course. Once again, you have responding type and initiating type again affiliative pragmatic again here and the same thing directing and informing and your higher your abstract concrete types. So what happens? You have again the combinations, so INFJ, so you are responding, affiliate directing abstract, responding affiliate directing concrete, responding pragmatic directing abstract, and responding pragmatic directing concrete.

So, again similar to the previous case you have 4-4 chunks created here. The first one is those who chart their course, second who are behind the scenes, third who are in charges and fourth they are the get things going people. So, 4 different subsets and all of them have 4 different permutation combinations. So, this is very interesting test gives you very very discreet explanation of individual characteristics you can map based on their MBTI course. This is one of the most popularly used test now a days, especially in the organizational set ups.

(Refer Slide Time: 12:20)

Personality Assessment: Big 5				
25 items				
STRONG ADJUSTMENT	Resilient	Responsive	Reactive	WEAK ADJUSTMENT
LOW SOCIAIBILITY	Introvert	Ambivert	Extrovert	HIGH SOCIAIBILITY
LOW OPENNESS	Preserver	Moderate	Explorer	HIGH OPENNESS
LOW AGREEABLENESS	Challenger	Negotiator	Adapter	HIGH AGREEABLENESS
LOW CONSCIENTIOUSNESS	Flexible	Balanced	Focused	HIGH CONSCIENTIOUSNESS

Another test you will find which is called the Big 5. This is a test which has no only 25 items. Now you just look back when we started with MMPI, MMPI had 500 plus items and when you come to big 5 it has only 25 items. So, why was said that psychologist suddenly decided that the number of items in individual personality assessment tools should reduced. What was the need for that? You can think of this. And similarly you can also think that why was there need to move from projective to psychometric or psychometric to projective which one is better, little later we will come to that. Let us first talk about big 5.

Now in big 5 what happens you have 25 items and you have two extreme ends, so strong adjustment, weak adjustments these are the two extreme ends. So, the left hand side that you see here on your screen strong adjustment looks low sociability, low openness, low agreeableness, and low conscientiousness. These are basically one side of the continuum other side of the continuum means weak adjustment, high sociability, high openness, high agreeableness and high conscientiousness. So, these are completely bipolar type of things. And within these two extreme ends lies three important possibilities.

For example, based on the score that you have obtained given on this 25 items on big 5 you could fall in one of the categories. So, between strong adjustment and weak adjustment the possibilities are you could be resilient, you could be responsive, and you could be reactive. Similarly, low sociability and high sociability are two extreme ends

and the possibilities are you could be introvert, you could be ambivert, and you could be extrovert, the two extreme possibilities of openness; low and high openness; so the possibilities are that you could be a preserver, you could be moderate or you could be an explorer.

Similarly for agreeableness the extreme possibilities are, you are high at it or you are low at it. From low towards high when you move the possibilities are you could be a challenger. You could be a negotiator or you could be an adapter. When we come to conscientiousness, again the extreme possibilities when you move from low to high the possibilities are you could be a flexible individual, you could be a balanced individual, you could be an extremely focused individual. So, what Big 5 does is that, it has 5 basic characteristics, adjustment, sociability, openness, agreeableness and conscientiousness. And then you have two extreme ends; the low and the high end of it and then between the low and high you have three different possibilities.

So, on each of them you would have a score. So, your adjustment score, your agreeableness score, sociability score, openness score, conscientiousness scores, will say how resilient responsive or reactive you are how introvert what are what, you are whether you are preserver whether you are moderate whether, you are explorer whether you prefer to challenge, negotiate or adapt, are you very flexible, are you very balanced or are you the one who extremely focused. So, Big 5 give you this option. There are many more versions known. And as I told you that there are large numbers of psychometrics tools available, for practical reasons we have limited time and therefore restricted ourselves only to 4 popular psychometrics tools.

Now coming back to the earlier question, why is it that number of items in psychometric tools reduced over a period of time? And how culture fair are these tests, culture fair means if the test was developed validated in say a Western culture how much is it a possibility that I can use the same test using the same norm in my cultural context. This is a big issue in psychology. Most of these tests are very very sensitive to certain cultural issues and therefore when you use it for your purpose in your cultural contexts you have to be extremely careful.

There is a concept of adaptation of test. So, many of the Western tools you would realize that they have been adapted. Means, the items have been relooked at you people have

done factor analysis to realize that the major factors remains the same as it was in the original tool. And also they have looked at the reliability and the ability of these tools. Why was there a need for reduction in the number of items? Perhaps and to greater extent this is true. The organizations which need your test that they tell you that they cannot give you in definite time to complete test, they cannot expose their employees to a testing session for a very long and therefore, the demand for a very crisp type of a test.

To develop tests which suits the need of the organizations you would realize that they are have been various tools which have been developed with less number of items. Unlike other types of tests like even Eyesenck inventory had 100 items, MMPI had 500 plus items, there are many old tools that you would realize at they have very exhaustive list of items. And these were the items which technically if you plot historically on the time line you would realize that they involved at the time when clinical diagnosis was extremely important. So, one was the issue of number of items.

Second, how to I choose whether to go for projective or a psychometric tool? The answer is extremely difficult. One as a psychologist, you should not take up a test based on your interest that I want to use this type of a test. Rather, it would be good to take a test which basically serves the purpose for which you are trying to test the individual. For instance if I am working in a clinical setup, I come across a case where the person is not very openly sharing the thoughts. And therefore it is very difficult for me to find out the complexes that the individual has, and which is a source of discomfort, a source of pathology for this very individual. Now in this type of a situation it is good to use say test like row shining blot test. As I was sharing that TAT is one of the tests which are very extensively used even for the selection of people in the uniform services.

Now if I am selecting a soldier, an officer in the armed forces who would be responsible for maintaining the morale, he would suppose to be he is likely to be a man of character an exemplary type of a personality, who would face very challenging circumstance, but would come forward with exemplary type of behavioral outcome. How do I assess? Now psychometric tools it gives you an item, it gives you a description and then you have certain choices. It could be a forced choice type of a thing yes no type of a pattern, or like a MMPI where you have three options yes no and not sure, or it could be say a 5 point scale, 7 point scale.

But then the intermediate variation is not there and to you could even lie. Of course, some of these tests have lie scores just like a MMPI had a lie score, Eyesenck test had a lie score. So, you could find that whether this individual has been consistent or not while responding to the items in the psychometric tool. Projective test takes care of this. If you use TAT you can very easily find out world view of the individual, you can very easily find out the inner complexes of the individual, and you can very easily draw a line to find out if a person who has these many complexes could be in these types of situations, whether this very individual would be good for my organization or not.

Remember, historically for a very very longer period time TAT has been in usage in the selection of officers for the armed forces. Situation reaction test when you induct people in the profession who would be given some task which are high state task basically. For example you are chosen in the allied forces, if you are say deputed in highway security.

Now, you have certain degree of authority invested in you, you are part of a law and enforcement agency which has invested great deal of authority; you can stop anybody, you can check anybody, you can examine somebody, you can take somebody in to custody, you can file case against somebody. Now how do I ensure that the authority that I invest in a given individual who joins my forces is really a worthy person and you would realize that situation reaction test which are very customized type of test developed exclusively for different type of services. They help you a lot, in terms of understanding the complex nature of the individual whom you are trying to induct in your force and therefore this is a making become CCR.

It is not that it is a full proof thing that these people do not commit any mistake; they do not take things in their hand, but then you find it very few people who have been inducted in to the service goes on the wrong track by and large people retain their integrity, they perform their duties to due diligence and professionalism. So, situation reaction test that serve such type of a purpose

Say for instance, if you have to conduct something in a group set up for example. Large number of employees in given organization, you want to identify who are the people who should be transferred to R&D section, who are the people who are who can be sent negotiate which are the other agencies, who are the people who would be very very

reluctant to these changes, who are the people who would be extremely balanced if they are given certain critical tasks; you can use big 5. Very easily you can slot people into different categories and then you know who would be better if centered this very position in this capacity in the organization. All of these tests have certain duties and depending on your need you can pick and chose any one of them.

With this way we conclude are discussion on the topic of personality. What we discussed initially was the full range of approaches that has been adapted by difference tools of thoughts, how they explain the personality of the individual emerges. We thankfully even went to the Indian construct, the Indian concept of personality the trigunas . And then we came heavily on the assessment part, how personality is assessed. So, with this we complete our discussion on personality.

Module 9: Methods in Psychology

**Lecture 1: Methods -
Introduction**

Overview

- Psychology as a science
- Inadequacy of commonsense approach
- Goals of psychology – Description and Explanation
- Why psychologists use scientific methods?
- Basis of scientific method – rationalism, empiricism and positivism
- The idea of control
- Some basic concepts

Is psychology a science?

- Definition: A science of human behavior and cognitive processes
- Science: Emphasis on scientific method of research
- Verifiable data and analysis of results based on precise and defined methods
- Objective is to understand the relationships among variables of interest
- Most psychologists use Scientific Method

Commonsense Approach

- Commonsense notions are not valid and most often are based on personal biases and prejudices
- Inadequacy of commonsense approach

Goals of Psychology

Description

- Description entails describing behavior through observation. In scientific inquiry observation needs to be objective
- Operational definition: Defining a concept by the processes used to measuring it

Goals of Psychology

Explanation

- Explanation involves understanding relationships among variables that have been observed
- Causation and correlation
- Importance of context

Why psychologists use scientific methods?

- To study relationships in a pure manner
- Scientific method: A system for reducing bias and error in the measurement of data

Basis of Scientific Method

- Empiricism
- Rationalism
- Search for laws
- Positivism
- Replication

Understanding Control

- Contemporary psychology relies on controlled observation
- Different methods vary as far as the extent of control is concerned
- Control: Manipulation by the investigator – only the independent variable changes
- Conditions that interfere with the manipulation are also controlled

Some Important Aspects

- A variable is a construct or a factor that can vary
- Experimental approach: Best suited for developing the knowledge suitable for understanding causal relationships
- Sometimes experiments can be impractical and unethical
- When lab research is not possible co-relational approach can be used

- Correlation and causation
- Laboratory research and field research
- Steps: Perceiving the question; forming a hypothesis; testing the hypothesis (Data collection and analysis); drawing conclusions; reporting result, theory building

Thank You

Module 9: Methods in Psychology

Lecture 2: The Experimental Method

The Experimental Method

- Correlation and Causation
- Case studies, surveys and interviews etc. do not allow establishing cause and effect relationships
- Some factors have to be controlled to establish cause and effect relationships
- Control is possible through experimental method

Experiment – An Introduction

- Experiment is observation under controlled condition
- Experimental psychologists set up laboratory versions of problems to be studied
- Because of the features of manipulation and control experiments provide an important tool for studying cause and effect relationships

Main Features

- Variables: Independent, dependent, relevant and nuisance variables
- Manipulation of independent variables
- Control of relevant and nuisance variables
- Operational definitions of variables

Experimental and Control Groups

- An experimental group is the group of subjects that receives a treatment or some value of the independent variable
- Control group is the group which is not given any treatment or value of the independent variable
- The experimental group and the control group are equivalent and vary only in terms of independent variable

Within-subjects Design

- Subjects serve as their own control
- Before introducing the independent variable, a baseline level of dependent variable is recorded and then the independent variable is introduced
- A-B-A within-subjects design

Important Aspects

- Random assignment of subjects to experimental groups
 - All participants have an equal probability of being assigned to any of the groups
- Control through matching
- Dealing with experimenter expectancy effects
- Dealing with social desirability effect
- Double blind procedure

Thank You

Module 9: Methods in Psychology

Lecture 3: Different Methods in Psychology

Methods in Psychology

- All the research problems that are relevant for psychological study cannot be studied in the laboratory situation
- Other Methods (Non – Experimental)
 - **Naturalistic observation**
 - **Case Studies**
 - **Interviews**
 - **Survey Method**
 - **Tests**

Naturalistic observation

- Observation in natural surroundings
- Advantages: Realistic picture
- Disadvantages: Effects of being observed;
Researcher's expectations

Case Studies

- Study of one individual, event, or any other entity in great detail
- Clinical case studies (all aspects of life are covered)
- Issue of generalization (cannot be generalized)
- Provide opportunity for an in-depth exploration

Interviews

- Can be used in the case study method or surveys
- Structured and unstructured interviews
- Questionnaires can be used in interviews and surveys both
- Surveys are more relevant if the study sample is very large
- Rapport and confidentiality

Survey Method

- Large number of people are studied
- Sample selection (representation of the population)
- Questionnaires, interviews, tests etc can be used
- Internet surveys
- Anonymous surveys
- Dealing with the 'courtesy bias'

Psychological Tests

- Objective and standardized measure of a sample of behavior
- Study individual differences
- Technical criteria: reliability, validity and standardization
- Can be used in case studies, Counseling

Technical criteria

- Reliability of a test refers to obtaining same result when the psychological test is given to the same individual more than once
- Split Half Reliability and Test – retest reliability
- Validity - The extent to which a test measures what it proposes to measure
- Content validity, Predictive validity, Concurrent validity
- Standardization

Thank You