الجمهورية الجزائرية الديمقراطية الشعبية
وزارة التعليم العالي والبحث العلمي
جامعة غليزان
كلية الآداب واللغات
المجلس العلمي

جامعة غليزان
RELIZANE UNIVERSITY

غليزان في : 2025/03/11.

مستخرج من محضر اجتماع المجلس العلمي 15 .

وافق المجلس العلمي لكلية الآداب واللغات المنعقد بتاريخ 2025/03/09 على اعتماد الحامل البيداغوجي المقدم من الأستاذ(ة) : بن عدة عبد الواحد من قسم اللغة الإنجليزية بعنوان: An introduction to cognitive psychology : the science of thinking

رئيس المجلس العلمي

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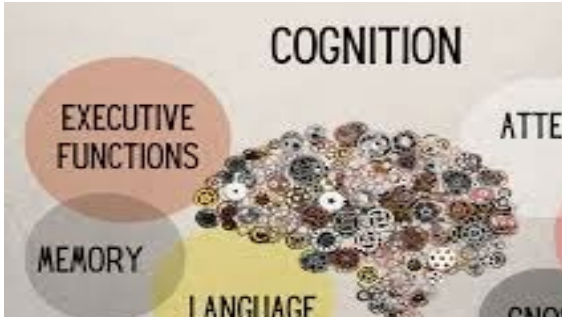


Pedagogical hand-out

An Introduction to Cognitive Psychology: The Science of Thinking

Document intended for students in LMD

Section: English
Module: Cognitive Psychology
Level: Third year Licence (L3)
Presented by: Dr.BENADDA Abdelouahid

Academic Year 2024/2025

Level	**L3**
Discovert Unit	**Cognitive Psychology**
Weekly Time Load	01h30. (**Lecture**)
Credit	2
Coefficient	1
Mode ofEvaluation	**Exam**

CourseDescription

This course serves as a comprehensive and practical resource specifically designed to enhance the preparedness of Licence students pursuing studies in the field of Cognitive Psychology practices. It aims to equip students with the essential knowledge, skills, and tools necessary to navigate the complexities of cognitive processes and their applications in real-world scenarios. Throughout the course, students will engage with a wide array of topics that describe how cognitive processes shape our interactions with the world around us. They will acquire a comprehensive understanding of key concepts, themes, challenges, and empirical studies within contemporary cognitive theory. This includes an examination of how we perceive stimuli from our environment, interpret those stimuli to make sense of our experiences, modify our responses based on new information, utilize cognitive strategies to navigate complex tasks, and retain information over time. The curriculum will also emphasize the importance of empirical research in cognitive psychology, encouraging students to critically evaluate studies that have contributed to our understanding of cognitive processes. By analysing various research methodologies, students will learn how cognitive psychologists design experiments, collect data, and draw conclusions about the workings of the mind.

CourseAssignments

Students' scores, in this course, will be based on their performance on a series of assignments that appear on this syllabus. The list of assignments provides students with what they need to do depending on thetopics.

Grading

Students are evaluated according to:

a) ***Non-cumulative exams (75%)***

b) ***Attendance and classroom presentation*** about topics included in this module. (25%

Domain: Foreign Languages

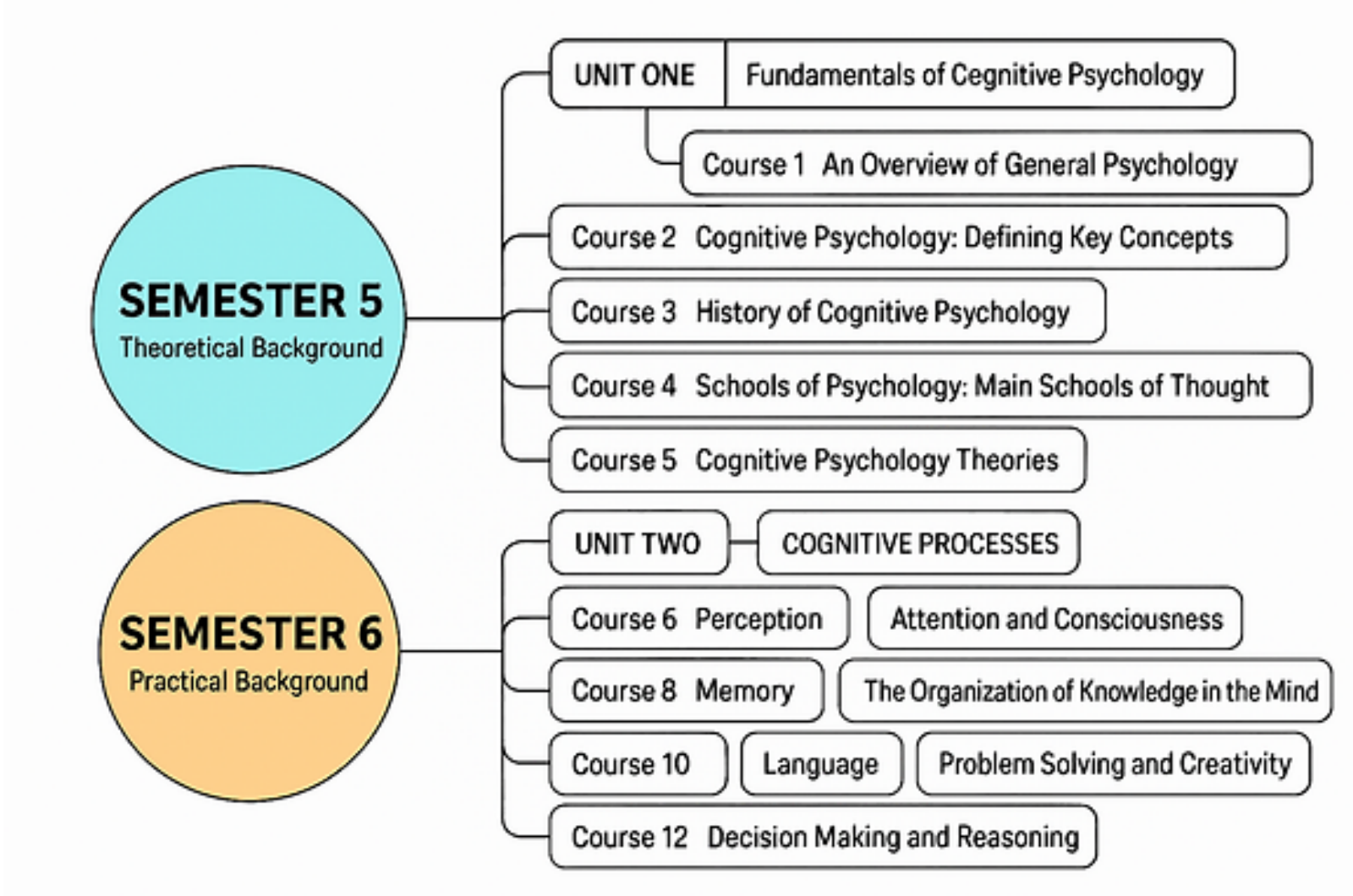
English Language

Semester 5

Teaching Units	Modules	Credits	coefficients					Assessment Mode	
				Lecture	TD			ContinuousAssessment	Exam
Fundamental Unit 1 : LanguageStudy	Linguistics	**4**	**2**	1h30	1h30	45h00	55h00	**50%**	**50%**
	Literature	**4**	**2**	1H30	1h30	45h00	55h00	**50%**	**50%**
	Civilisation	**4**	**2**	1h30	1h30	45h00	55h00	**50%**	**50%**
Fundamental Unit 2: Practice of the language	Written Comprehension & production	**2**	**1**		1H30	22h30	27H30	**50%**	**50%**
	Oral Comprehension & production	**2**	**1**		1h30	22h30	27h30	**50%**	**50%**
Fundamental Unit 3 : Language usage	Introduction to didactics	2	1	1h30		22h30	27h30		100%
	ESP	2	1		1h30	22h30	27h30	50%	50%
MéthodologicalUnits	Research Techniques	**4**	**2**		3h00	45h00	55h00	**50%**	**50%**
	Techniques of information and communication	**2**	**1**		1h30	45h00	55h00	**50%**	**50%**
Discovery Unit	**Cognitive Psychology**	**2**	**1**	**1h30**		**22h30**	**2h30**		**100%**
	Translation	**1**	**1**		1h30	22h30	2h30	**50%**	**50%**
Transversal Unit	French	**1**		1h30		22h30	2h30		**100%**
Total semester5		**30**	**17**	**07h 30**	**16h30**	**382h30**	**392h30**		

Semestre 6

Teaching Units	Modules	Credits	Coefficients					Evaluation Mode	
				Lecture	TD			Continuous Assessment	Exam
Fundamental Unit 1 LanguageStudy	Linguistics	**4**	**2**	1h30	1h30	45h00	55h00	**50%**	**50%**
	Literature	**4**	**2**	1H30	1h30	45H00	55H00	**50%**	**50%**
	Civilisation	**4**	**2**	1h30	1h30	45h00	55h00	**50%**	**50%**
Fundamental Unit 2 Practice of the language	Written Comprehension & production	**2**	**1**		1H30	22h30	27h300	**50%**	**50%**
	Oral Comprehension & production	**2**	**1**		1h30	22h30	27h30	**50%**	**50%**
Fundamental Unit 3 Language usage	Introduction to didactics	2	1	1h30		22h30	27h30		100%
	ESP	**2**	**1**		1h30	22h30	27h30	**50%**	**50%**
MethodologicalUnits	Research Techniques	**4**	**2**		3h00	45h00	55h00	**50%**	**50%**
	Techniques of information and communication	**2**	**1**		1h30	45h00	55h00	**50%**	**50%**
Discovery Unit	**Cognitive Psychology**	**2**	**1**	**1h30**		**22h30**	**2h30**		**100%**
	Translation	**1**	**1**		1h30	22h30	2h30	**50%**	**50%**
Transversal Unit	French	**1**	**1**	1h30		22h30	2h30		**100%**
Total semester 6		**30**	**17**	**07h 30**	**16h30**	**382h30**	**392h30**		


SEMESTER 5
Theoretical Background
UNIT ONE
Fundamentals of Cegnitive Psychology
Course 1 An Overview of General Psychology
Course 2 Cognitive Psychology: Defining Key Concepts
Course 3 History of Cognitive Psychology
Course 4 Schools of Psychology: Main Schools of Thought
Course 5 Cognitive Psychology Theories
SEMESTER 6
Practical Background
UNIT TWO
COGNITIVE PROCESSES
Course 6 Perception
Attention and Consciousness
Course 8 Memory
The Organization of Knowledge in the Mind
Course 10
Language
Problem Solving and Creativity
Course 12 Decision Making and Reasoning

THE COURSESYLLABUS

SEMESTER 5 (Theoretical Background)
UNIT ONE: Fundamentals of Cognitive Psychology

Course 1: An Overview of General Psychology

Course 2: Cognitive Psychology: Defining Key Concepts

Course 3: History of Cognitive psychology

Course 4: Schools of Psychology: Main Schools of Thought

Course 5:Cognitive Psychology Theories

SEMESTER 6 (Practical Background)
UNIT TWO:COGNITIVE PROCESSES

Course 6: Perception

Course 7: Attention and Consciousness

Course 8: Memory

Course 9: The Organization of Knowledge in the Mind

Course 10: Language

Course11: Problem Solving and Creativity

Course12: Decision Making and Reasoning

LearningOutcomes

By the end of the course, students are expected to achieve the following objectives:

- Demonstrate an understanding of the key concepts and theories in cognitive psychology.
- exhibit an understanding of how the mind can be studied in a scientific way using experiments
- develop knowledge of the psychology of reasoning and thinking
- make evident a knowledge of the psychology of mental imagery
- analyse and evaluate the methods used in cognitive psychology research.
- apply cognitive psychology principles to real-world situations and problem-solving.
- critically assess contemporary issues and debates within the field of cognitive psychology.
- understand and be able to apply psychological principles to individual, interpersonal, group, and societal issues.
- value empirical evidence, tolerate ambiguity, act ethically, and recognize their role and responsibility as a member of society.

Table ofContents

Introduction

Cognitive psychology is a specialized area within the broader field of psychology that focuses on understanding the complex processes involved in human thought. This branch of psychology delves into how people perceive, remember, think, and learn, providing insights into the mental mechanisms that underpin our everyday experiences. By examining cognitive functions, cognitive psychology emphasizes the interplay between various mental processes, including perception, attention, memory, language, and reasoning, as well as their relationship with emotions, creativity, and problem-solving skills. One of the key objectives of cognitive psychology is to explore how these cognitive functions interact with one another and influence individual thought patterns and reasoning. For instance, researchers in this field investigate how emotions can affect decision-making processes, how creativity can enhance problem-solving abilities, and how different cognitive strategies can lead to more effective learning outcomes. This holistic approach allows for a deeper understanding of the complexities of human thought and behaviour. Moreover, cognitive psychology seeks to quantify various forms of intelligence, recognizing that intelligence is not a singular construct but rather a multifaceted phenomenon. By developing assessments and measurement tools, cognitive psychologists aim to evaluate different types of cognitive abilities, such as analytical thinking, spatial reasoning, and verbal skills. This quantification helps in identifying individual strengths and weaknesses, which can be particularly useful in educational and clinical settings. In addition to measuring intelligence, cognitive psychology also analyses the organization of thoughts and the distinct elements of cognitive functioning. This includes studying how information is processed, stored, and retrieved in the brain, as well as how cognitive schemas and mental models shape our understanding of the world. By examining these organizational structures, cognitive psychologists can gain insights into how people construct knowledge, make inferences, and solve problems. Furthermore, cognitive psychology has practical applications across various domains, including education, therapy, artificial intelligence, and human-computer interaction. In educational settings, cognitive principles can inform teaching strategies that enhance learning and retention. In therapeutic contexts, understanding cognitive processes can aid in the development of interventions for mental health issues, such as cognitive-behavioural therapy, which focuses on modifying dysfunctional thought patterns. Overall, cognitive psychology represents a dynamic and evolving field that seeks to unravel the complexities of human thought. By exploring the intricate relationships between cognitive functions, emotions, creativity, and problem-solving skills, this discipline contributes to a more comprehensive

understanding of how we think, learn, and interact with the world around us. Through on-going research and application, cognitive psychology continues to illuminate the pathways of the mind, offering valuable insights that can enhance both individual and collective human experiences.

UNIT ONE:Fundamentals of Cognitive Psychology

Course 1: An Overview of General Psychology

- **Course Scope**: An introduction to the general domain of psychology (This course is an introduction to the subject of psychology: the scientific study of how we think, feel and act.)
- **Course Learning Objectives**

At the conclusion of this course, you should be able to:

- Define psychology
- Understand the merits of an education in psychology
- understand and discuss key concepts in Psychology.
- reflect on the relationship between these concepts .

Guiding Thoughts to the Course

1. How do you explain psychology?
2. Why is it important to study psychology?
3. Who first introduced cognitive psychology?

- **Course Content**

- **Psychology: An Overview**

The concept of "psychology" emerged in the fifteenth century, paralleling the rise of modern intellectual movements that began to reshape medieval paradigms. This period marked a significant shift in human thought, as scholars began to question traditional beliefs and sought to understand the human experience through observation and reason. The term "psychology" itself is derived from the Greek words ***"psyche,"*** meaning soul or mind, and ***"logos,"*** meaning study or discourse. Thus, psychology can be understood as the study of the mind and behaviour, covering the sum of an individual's non-physical characteristics, including thoughts, emotions, and motivations.

As a discipline, psychology functions as both a theoretical and practical domain, dedicated to the systematic study of mental processes and behaviours. It seeks to understand how individuals think, feel, and act in various contexts, and how these processes are influenced by a multitude of factors, including biological, social, and environmental influences. The field of psychology is fundamentally interdisciplinary, integrating insights from biology, sociology,

anthropology, and philosophy to develop a holistic comprehension of human comportment. Psychology can be divided into several subfields, each focusing on different aspects of human experience.

Psychology employs a variety of research methods to gather data and test hypotheses. These methods range from experimental studies, which manipulate variables to observe effects, to observational studies, which involve watching and recording behaviour in natural settings. Surveys and case studies are also commonly used to collect information about individuals' thoughts and experiences. The integration of quantitative and qualitative research approaches allows psychologists to develop a more nuanced understanding of complex human behaviours.

Furthermore, psychology is not only concerned with understanding mental processes but also with applying this knowledge to improve individual and societal well-being. Applied psychology encompasses various practices, including counselling, therapy, and organizational psychology, which aim to address real-world issues and enhance the quality of life. As the discipline of psychology progresses, it increasingly integrates technological advancements, which have the potential to revolutionize both research and practice.Moreover, the incorporation of artificial intelligence and machine learning into the fields of psychological research and practice presents significant potential for improving the accuracy of diagnoses and the effectiveness of treatments.

Psychology Defined

The word psychology derives from the Greek word psyche, for spirit or soul. The latter part of the word psychology derives from -λογία -logia, which means "study" or "research"1. It is broadly defined as the scientific study of the mind and behaviour. It is including a wide range of aspects including thoughts, emotions, and actions. This multifaceted discipline aims to explore and understand the complexities of human experience, delving into how individuals think, feel, and behave in various contexts.

- In 1890, William James defined psychology as "the science of mental life, both of its phenomena and their conditions."[2]
- Psychology is the scientific study of mind and behaviour[3].

Psychology is defined as the scientific study of the mind and behaviour, encompassing a

[1]https://en.wikipedia.org/wiki/Psychology#cite_note-OED-10
[2]https://en.wikipedia.org/wiki/Psychology#cite_note-James_1890-14
[3]https://www.oed.com/search/dictionary/?scope=Entries&q=psychology&tl=true

wide range of aspects including thoughts, emotions, and actions. This multifaceted discipline aims to explore and understand the complexities of human experience, delving into how individuals think, feel, and behave in various contexts.

At its core, psychology seeks to unravel the intricacies of mental processes and the underlying mechanisms that drive behaviour. This includes examining cognitive functions such as perception, memory, and decision-making, as well as emotional responses and their impact on behaviour. By investigating these elements, psychologists aim to establish general principles that can explain patterns of behaviour across different populations and situations.

Ultimately, the goal of psychology is not only to understand the underlying principles of behaviour and mental processes but also to apply this knowledge in practical ways. This can involve developing therapeutic techniques to help individuals cope with mental health issues, creating educational programs to enhance learning, or implementing strategies to improve workplace dynamics. Through its scientific approach, psychology strives to enhance the well-being of individuals and communities, making it a vital field of study in our increasingly complex world.

Importance of psychology

The importance of psychology includes[4] :

1. **Understanding behaviour**: Psychology helps describe, explain, predict, and change human behaviour.
2. **Improving communication**: It enhances understanding of how humans think and behave, leading to better communication.
3. **Building self-confidence**: Self-awareness and understanding contribute to higher self-confidence.
4. **Enriching careers**: Psychology helps understand coworkers and build workplace friendships.

Why study psychology?

There are as many reasons why you study psychology. In general, the study of psychology has numerous basic goals:

[4]https://owlcation.com/social-sciences/Psychology-and-its-Importance

1. Understand people better: Psychology explores the human mind and discovers why we think and act the way we do. It is a fascinating area where you will gain insight into people's behaviours, perceptions and motivations.

2. Have an impact on society: Psychology plays a vital role in society, in aspects from education to the economy. It helps to manage stress and work towards improving people's wellbeing.

3. Explore many career possibilities: There are plenty of professional options for you to pursue.

3. Boost your social skills: you will get to understand the human condition, learn how to engage with people effectively and be able to discuss topics clearly. Communication is a critical element of our daily lives, and good interpersonal skills are beneficial for job interviews and workplace relationships.

6. Gain transferable skills: you will gain many transferable skills such as teamwork, critical thinking, project management and research.

- **Domains of Psychology**

Psychology includes many sub-fields of study and application concerned with such areas as human development, sports, health, industry and spirituality.

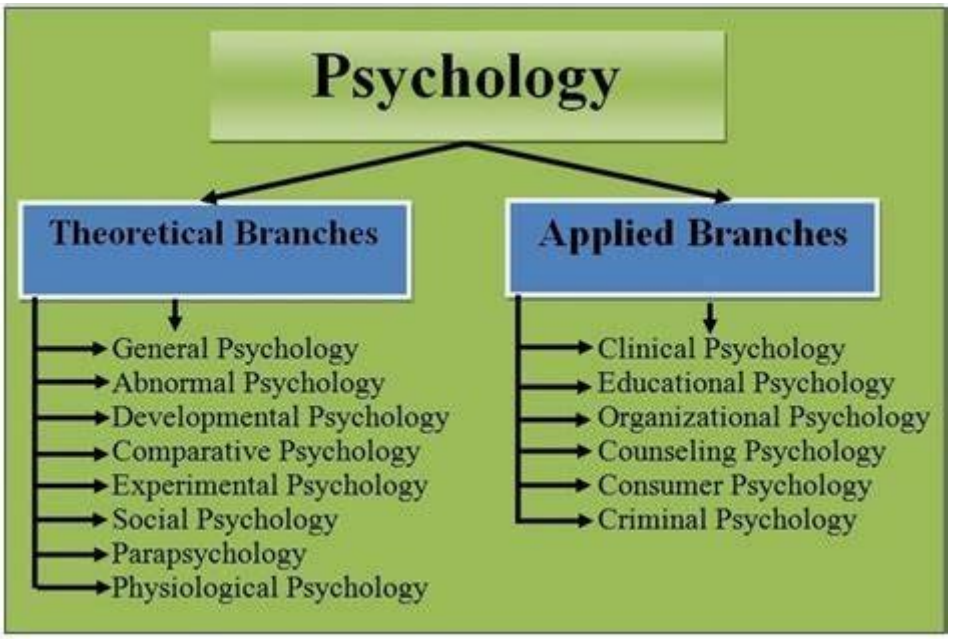


Fig 1: Branches of Theoretical Psychology[5]

[5]https://psychologyeducational.com/applied-psychology/blogs/

- **Biopsychology** is concerned with the biological basis of behaviour.
- **Abnormal Psychology**: Focuses on psychopathology and abnormal behaviour.
- **Experimental psychology** studies the processes of sensing, perceiving, learning and thinking about the world.
- **Cognitive psychology** deals with the higher mental processes like thinking, language, memory, problem solving, knowing, reasoning, judging and decision making.
- **Developmental and personalitypsychology** consider the change and individual differences.
- **Health, clinical and counseling** branches of psychology aim at promoting physical and mental health.
- **Educational psychology** explores how the educational process affects students. In addition, school psychologists seek for assessing and treating the academic and emotional problems of children in elementary and secondary schools.
- **Clinical Psychology**: Deals with assessment, diagnosis, and treatment of mental health disorders.
- **Social psychology** studies how people's thoughts, feelings and actions are affected by other people.

COURSE SUMMARY

Semester 5: Theoretical Background
Unit One: Fundamentals of Cognitive Psychology

Psychology is the scientific study of behaviour and mental processes. This course introduces the discipline by explaining its dual nature: psychology as both a science and a profession. As a science, psychology relies on systematic observation, experimentation, and analysis to understand how humans think, feel, and act. As a profession, psychology applies this knowledge to improve mental health, education, work performance, and social relationships.

The **major perspectives in psychology**:

- **Biological psychology** explores how the brain, nervous system, and genetics influence behaviour.
- **Cognitive psychology** focuses on mental processes such as perception, memory, and problem-solving.
- **Developmental psychology** studies how people change across the lifespan.
- **Social psychology** examines how individuals interact within groups and societies.
- **Clinical psychology** addresses mental health disorders and therapeutic interventions.

Research methods: controlled experiments, case studies, surveys, and naturalistic observation. Ethical standards are emphasized, ensuring that participants are treated with respect and safety. Practical applications are highlighted throughout. For example, understanding motivation can improve workplace productivity, while knowledge of learning principles can enhance education. By the end of the course, students appreciate psychology as a broad field that connects scientific inquiry with everyday human experience.

TEST YOUR UNDERSTANDING
Course 1: An Overview of General Psychology

1. **Which of the following best defines psychology?**
   - A) Study of the soul
   - B) Scientific study of behaviour and mental processes
   - C) Study of emotions only
   - D) Study of physical health

   Hint: Think of psychology as both science and study of the mind
   Explanation: Psychology is defined as the scientific study of behaviour and mental processes.

2. **Which branch studies changes across the lifespan?**
   - A) Clinical psychology
   - B) Developmental psychology
   - C) Social psychology
   - D) Cognitive psychology
   - *Hint:* It focuses on growth and change.
   - *Explanation:* Developmental psychology studies physical, emotional, and cognitive changes across life stages.
3. **Which method involves observing behaviour in natural settings?**
   - A) Case study
   - B) Survey
   - C) Naturalistic observation
   - D) Experiment
   - *Hint:* Think of watching people without interference.
   - *Explanation:* Naturalistic observation studies behaviour in real-world environments.
4. **Who is considered the father of modern psychology?**
   - A) Freud
   - B) Wundt
   - C) Watson
   - D) Skinner
   - *Hint:* He opened the first psychology lab.
   - *Explanation:* Wilhelm Wundt established the first psychology laboratory in 1879.
5. **Which perspective emphasizes brain and genetics?**
   - A) Humanistic
   - B) Biological
   - C) Behavioural
   - D) Psychoanalytic
   - *Hint:* Think of biology's role in psychology
   - *Explanation:* Biological psychology studies how the brain and genetics influence behaviour.

Supplemental Resources

Readings

Read these two articles for more details about the field of psychology.

- Overview of Psychology for Beginners available at: https://www.verywellmind.com/introduction-to-psychology-2795610
- BBC Science | Human Body & Mind | What is Psychology? available at: https://www.bbc.co.uk/science/humanbody/mind/articles/psychology/what_is_psychology.shtml

Videos

Watch these videos to conceive a clear idea about Psychology:

- Intro to Psychology: Crash Course Psychology At: https://www.bing.com/videos/riverview/relatedvideo?&q=what+is+psychology&&mid=CA58F9F3D9F3FF79E223CA58F9F3D9F3FF79E223&&FORM=GVRPTV
- What is Psychology | A Brief Introduction to Psychologyhttps://www.bing.com/videos/riverview/relatedvideo?&q=Psychology+Definition&&mid=9EFB98641C8DF515CDF99EFB98641C8DF515CDF9&&FORM=VRDGAR
- What is Psychology |https://www.bing.com/videos/riverview/relatedvideo?&q=what+is+psychology&&mid=80F0E60219EDB29B704E80F0E60219EDB29B704E&&FORM=GVRPTV
- 14 Branches of Psychology - Educational Psychology at https://psychologyeducational.com/applied-psychology/blogs/

Assignment: Check your progress

1. Define Psychology in your own words.

- Reflect on your online and classroom discussions and readings and summarize your response in one to two paragraphs

1. Group discussion

Here are some questions to answer as an extension of the course content (To be discussed in groups):

1. What is the significance of Psychology for you?
2. What are the benefits of learning psychology?
3. What is the goal of psychology?

Web Resources

1. Psychology: Careers, Areas of Study, and Impact - https://www.verywellmind.com

2. Impact of Psychology https://www.verywellmind.com/psychology-4014660#:~:text=Psychology%20is%20both%20an%20applied%20and%20academic

3. Psychology | Definition, History, Fields, Methods, & Facts https://www.britannica.com › science

4. What Is Psychology? https://www.simplypsychology.org › what is psychology

Course 2: Cognitive Psychology: Defining Key Concepts

- **Course Scope**: An introduction to the general domain of psychology (This course is an introduction to cognitive psychologymajor key concepts)
- **Course Learning Objectives**

At the conclusion of this course, you should be able to:

- understand and discuss key concepts in Cognitive Psychology.
- reflect on the relationship between these concepts .

Guiding Thoughts to the Course

4. How do you explain cognitive psychology?
5. What is the basic principle of cognitive psychology?
6. Why is it important to study cognitive psychology?
7. Who first introduced cognitive psychology?

- **Course Content**

- **Introduction to cognitive psychology**

The term "cognitive psychology"(latin: ***cognoscere***; greek: ***gignoskein*** = to know, perceive) was first used in 1967 by American psychologist *Ulric Neisser* in his book *Cognitive Psychology*. Neisser went on to define cognitive psychology by saying that cognition involves ***"all processes by which the sensory input is transformed, reduced, elaborated, stored, recovered, and used."***[6] Neisser also suggested that given such a broad and sweeping definition, cognition was involved in anything and everything that people do.

- **Cognitive psychology defined**

- The word "cognitive" refers to thinking. So cognitive psychology is a branch of psychology that aims to understand mental processes such as perception, learning, memory, language, decision-making, and problem-solving. It also examines how these processes affect our behaviour and our emotions (APA, 2023)[7].
    - Cognitive psychology is defined as the study of individual-level mental processes such as information processing, attention, language use, memory,

[6] Neisser, U. (1967). Cognitive Psychology. New York: Appleton-Century-Crofts.
[7] American Psychological Association. (2023). ***Apa Dictionary of Psychology.*** American Psychological Association. https://dictionary.apa.org/perception

perception, problem solving, decision-making, and thinking (Gerrig and Zimbardo 2002)[8].

- It is a branch of psychology concerned with mental processes (as perception, thinking, learning, and memory) especially with respect to the internal events occurring between sensory stimulation and the overt expression of behaviour.[9]

Importance of Cognitive Psychology

Cognitive psychology has given us important understanding of how our minds function. This understanding has helped improve therapy, education, decision-making, and even artificial intelligence (AI).

- **Psychotherapy:** Cognitive psychology led to the development of cognitive behaviour therapy, one of the most widely used types of therapy used today. It uses a combination of behavioural and cognitive.

- **Education:** Because of its focus on learning, attention, and memory, cognitive psychology has made important contributions to education.
- **Decision-making:** Decisions are influenced by our perceptions, focus, and memory, all of which are key areas of study within cognitive psychology.. Cognitive psychology has also made significant contributions to understanding how and why we use biases (stereotyping) and heuristics (simple rules of thumb) in decision-making.

Artificial Intelligence (AI): Examining how we think helps researchers create AI systems that imitate human intelligence, improving their ability to interact with people.

Cognitive Psychology Approach

A key idea in cognitive psychology is that mental processes like thoughts and feelings play a significant role in shaping our behaviour and can be examined. Cognitive psychology has three main approaches: experimental psychology, computational psychology, and cognitive neuroscience (Forstmann et al., 2011)[10].

[8]Zimbardo, P. G., &Gerrig, R. J. (2002). Perception. In D. J. Levitin (Ed.), Foundations of cognitive psychology: Core readings. MIT Press

[9] https://www.merriam-webster.com/dictionary/cognitive psychology

[10]Forstmann, B.U., Wagenmakers, E., Eichele, T., Brown, S.D., &Serences, J.T. (2011). Reciprocal relations between cognitive neuroscience and formal cognitive models: opposites attract? Trends in Cognitive Sciences, *15, 272-279.*

1. **The experimental approach:** gathers behavioural data through carefully designed experiments. I will explain some experiments shortly.
2. **The computational psychology:** approach employs computer and mathematical models to simulate human behaviour in cognitive tasks.
3. **Cognitive neuroscience:** studies brain activity and its connection to thinking and perception.

- **Key Terms Related to Cognitive psychology**

- **Cognitive Psychology & Neuroscience**

- **Cognitive psychology** focuses on the study of the mind and behaviour, whereas
- **neuroscience** investigates the brain's structure and its functions. Despite their distinct areas of emphasis, these two fields are closely connected.
- **Cognitive neuroscience** serves as a bridge between these two domains, exploring the interaction between the mind and the brain, specifically how cognitive processes are realized within the brain.

COURSE SUMMARY
Course 2: Cognitive Psychology: Defining Key Concepts

This course introduces the **core concepts of cognitive psychology**, the branch of psychology that studies mental processes. Cognition is defined as the set of processes involved in acquiring, storing, and using knowledge.

Key domains include:

- **Perception:** how we interpret sensory information.
- **Attention:** how we focus on certain stimuli while ignoring others.
- **Memory:** how information is encoded, stored, and retrieved.
- **Language:** how we understand and produce communication.
- **Reasoning and problem-solving:** how we make decisions and solve challenges.

The course emphasizes **mental representations** — the way knowledge is stored in the mind — and **information processing**, which describes how the brain encodes and retrieves data. Schemas, or mental frameworks, are introduced as tools that help organize knowledge. Examples are drawn from daily life: attention allows us to focus on a conversation in a noisy room, while memory enables us to recall past experiences. The course also highlights the interdisciplinary nature of cognitive psychology, showing its connections to neuroscience, linguistics, and artificial intelligence.

By clarifying these concepts, students build a foundation for understanding how the mind operates in complex and dynamic ways.

TEST YOUR UNDERSTANDING
Course 2: Cognitive Psychology: Defining Key Concepts

1. **Cognition refers to:**
   - A) Emotional responses
   - B) Mental processes of acquiring and using knowledge
   - C) Physical reflexes
   - D) Social interactions
   - *Hint:* It's about thinking and knowing.
   - *Explanation:* Cognition involves perception, memory, attention, and reasoning.
2. **Which is NOT a cognitive process?**
   - A) Perception
   - B) Memory
   - C) Breathing
   - D) Language
   - *Hint:* Think of automatic bodily functions.
   - *Explanation:* Breathing is physiological, not cognitive.
3. **Schemas are:**
   - A) Emotional states
   - B) Mental frameworks organizing knowledge
   - C) Reflex actions
   - D) Genetic codes *Hint:* They help us interpret information. *Explanation:* Schemas structure knowledge and guide perception.
4. **Which field influenced cognitive psychology most?**
   - A) Astronomy
   - B) Computer science
   - C) Chemistry
   - D) Geography
   - *Hint:* Think of information processing.
   - *Explanation:* Computer science inspired models of the mind as an information processor.
5. **Attention allows us to:**
   - A) Ignore all stimuli
   - B) Focus on relevant information
   - C) Store memories permanently
   - D) Eliminate distractions completely
   - *Hint:* It's about selective focus.
   - *Explanation:* Attention helps us concentrate on important stimuli.

Supplemental Resources

Readings

- Read these two articles for more details about Cognitive psychology
- Cognitive Psychology: How Scientists Study the Mind

  https://www.webmd.com/mental-health/what-is-cognitive-psychology
- The History ofCognitive Psychology Examples
  https://www.webmd.com/mental-health/what-is-cognitive-psychology#091e9c5e823f44a2-1-

Videos

Watch these videos to conceive a clear idea about Didactics:

- Cognitive Psychology explained At:
  https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://www.youtube.com/watch%3Fv%3D0y64SH05hAM

- Cognitive Psychology | Definition, Processes & Theories – Video At
  https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://study.com/academy/lesson/video/what-is-cognitive-psychology-definition-theories-quiz.html

Assignment: Check your progress

1. Define Cognitive Psychology in your own words.
2. Compare both concepts ofPsychology and Cognitive Psychology

- Reflect on your online and classroom discussions and readings and summarize your response in one to two paragraphs

2. Group discussion

- Basing on theonline and classroom discussions and readings discuss the following topic: How can the knowledge of Psychology improve your behaviour?

Web Resources

Articles Related to Cognitive Psychology Want to learn more? Check out these articles:

Definition of Psychology: Types, Concepts, & Examples

https://www.berkeleywellbeing.com/definition-of-psychology.html

Minimizing: Definition in Psychology, Theory, & Examples

https://www.berkeleywellbeing.com/minimizing.html

The Halo Effect: Definition, Examples, & Theory

https://www.berkeleywellbeing.com/halo-effect.html

Social Psychology: Definition, Theory, & Examples

https://www.berkeleywellbeing.com/social-psychology.html

Course 3: History of Cognitive psychology

- **Course Scope**: An introduction to the general domain of Cognitive Psychology. (This course is an overview of thehistory of cognitive psychology)
- **Course Learning Objectives**

  At the conclusion of this course, you should be able to:

  - Describe the basics of cognitive psychology
  - Summarize the history of psychology, focusing on the major schools of thought

Guiding Thoughts to the Course

1. How did the concept of Cognitive Psychology evolve historically?
2. What is the scope of Cognitive Psychology?

- **History of Cognitive Psychology**

The roots of cognitive psychology can be traced back much further, and is intimately intertwined with the history of experimental psychology. This leads back to the time period when the empiricist, rationalist, and structuralist schools of thought whichincluded philosophical works of Plato, Aristotle that dealt with the philosophy of mind Cognitive psychology emerged as a separate branch of psychology in the mid-1900s. e history of cognitive psychology can be parsed into four periods: philosophical, early experimental, the cognitive revolution, and modern cognitive psychology.

1. Early Thoughts on Thinking

Cognitive psychology is mainly concerned with the answers to two main questions: ***Where did knowledge come from?*** and ***how is it represented in the mind?*** These questions are fundamental. Two answers have been proposed. The **empiricists** maintain that knowledge comes from experience, and the **nativists** suggest that knowledge is based on innate characteristics of the brain. With these issues ancient philosophers and early psychologists tackled the issue. The fascination with knowledge can be traced to the earliest writings. Early theories were concerned with the seat of thought and memory. Ancient Egyptian hieroglyphics suggest their authors believed that knowledge was localised in the heart—a view shared by the early Greek philosopher Aristotle but not by Plato, who held that the brain was the locus of knowledge.

2. Cognition in the Renaissance and Beyond Renaissance

Philosophers and theologians seemed generally satisfied that knowledge was located in the brain. They considered that knowledge was acquired not only through the physical senses (mundus sensibilis – touch, taste, smell, vision, and hearing) but also from divine sources (mundus intellectualis—Deus).

During the 18th century, the British empiricists, George Berkeley, David Hume, and, later, James Mill and his son John Stuart Mill suggested that internal representation is of three types: (1) direct sensory events, (2) faint copies of percepts, or those that are stored in memory; and (3) transformation of these faint copies, as in associated thought. These notions are the basis of much current research in cognitive psychology. ***During the 19th century***, the early psychologists like Gustav Fechner, Franz Brentano, Hermann Helmholtz, Wilhelm Wundt, G; E. Muller, Oswald Kulpe, Hermann Ebbinghaus, Sir Francis Galton, Edward Titchener, and William James and others started to break away from philosophy to form a discipline based on empirical results rather than on speculation.

In 1870, German psychologist Wilhelm Wundt was the first to approach psychology as a science. Wundt attempted to investigate the mind through introspection, by systematically observing conscious experiences.

Edward Titchener, a student of Wundt, developed this further by introducing the concept of structuralism. Structuralism attempts to break our experiences down into basic elements to analyse them. Titchener divided experiences into sensations (sights, sounds, tastes), images (thoughts, ideas), and affections (emotions).

By the last half of the 19th century, theories of the representation of knowledge were clearly dichotomous: that emphasised the structure of mental representation (Wundt, Titchner); and the processes or acts (Brentano).

About the same time in America, William James critically analysed the new psychology that was developing in Germany. He established the first' psychological laboratory in America, wrote the definitive work in psychology in 1890 (Principles of Psychology), and developed a well-reasoned model of the mind.

Cognitive Psychology—As it is Today

- ***From the 1920s to the 1950s,*** behaviourism (or **behavioural psychology**) was the dominant approach to studying behaviour. This theory arose out of the criticism that introspection was not scientific enough because the inner workings of the mind could not be observed. It claims that all behaviour can be explained by examining **positive**

reinforcements (rewards) and punishments. Thoughts, memories, and emotions were deemed "unscientific".

•In the 1950s and 60s, researchers returned to studying mental processes. This came about for several reasons. Behaviourism was criticized because it did not explain complex cognitive processes and subjective experiences.

Among the most important forces accounting for this neocognitive revolution were the following:

- ***The "failure" of behaviourism***.

Behaviourism, which generally studied overt responses to stimuli, failed to account for the diversity of human behaviour as in the case of language. Furthermore, there were some topics ignored by the behaviourists that seemed to be profoundly related to human psychology. These included memory, attention, consciousness, thinking, and imagery. It was apparent that internal mental processes were very real parts of psychology and required investigation.

- ***The emergence of communication theory***. Communication theory prompted experiments in signal detection, attention, cybernetics, and information theory – areas of significance to cognitive psychology.

- ***Modem linguistics***. Another major influencer that sparked the return to cognitive theory was renowned linguist Noam Chomsky. He argued that language acquisition could not be explained only with behaviourist concepts and that much of it is innate rather than learned.

- ***Memory research.*** Research in verbal learning and semantic organisation provided a sturdy empirical base for theories of memory, which led to the development of models of memory systems and the appearance of testable models of other cognitive processes.

- ***The development of computer science***: in the 1960s and 70s computer science contributed to seeing the human mind as an information processing system and comparing it to a computer. This is often referred to as the Computational Theory of Mind (CTM).

- ***Cognitive Neuroscience:*** Starting in the 1980s, the use of brain imaging techniques such as magnetic resonance imaging (MRI) allowed researchers to combine cognitive psychology with neuroscience. This technology allows researchers to observe the

brain during cognitive processes. This led to the new field of cognitive neuroscience that explores the relationship of our mental processes with brain activity.

- ***Contemporary Subfields:*** Cognitive psychology continues to evolve and has recently led to several subfields. These include attention, perception, memory, language, decision-making, and problem solving.

COURSE SUMMARY

Course 3: History of Cognitive Psychology

The history of cognitive psychology traces the evolution of ideas about the mind. Early roots are found in philosophy, with thinkers like **Plato** and **Aristotle** debating the nature of knowledge and thought. In the late 19th century, psychology emerged as a scientific discipline through figures like **Wilhelm Wundt**, who established the first psychology laboratory, and **Edward Titchener**, who promoted structuralism.

The early 20th century saw the rise of **behaviourism**, led by **John Watson** and **B.F. Skinner**, which rejected the study of mental processes in favor of observable behaviour. However, limitations of behaviourism — such as its inability to explain language acquisition — led to the **Cognitive Revolution** in the 1950s and 1960s.

Influenced by developments in computer science, linguistics, and neuroscience, psychologists began to study the mind as an information-processing system. **Ulric Neisser's 1967 book *Cognitive Psychology*** formalized the field, emphasizing perception, memory, and problem-solving.

This course highlights how cognitive psychology grew from philosophical speculation to a rigorous scientific discipline, shaped by technological and theoretical advances.

TEST YOUR UNDERSTANDING
Course 3: History of Cognitive Psychology

1. **Who established the first psychology lab?**
   - A) Watson
   - B) Wundt
   - C) Freud
   - D) Skinner
   - *Hint:* Think 1879 in Leipzig.
   - *Explanation:* Wilhelm Wundt founded the first psychology lab.
2. **Which school rejected mental processes?**
   - A) Structuralism
   - B) Behaviourism
   - C) Functionalism
   - D) Humanism
   - *Hint:* Focused only on observable behaviour.
   - *Explanation:* Behaviourism ignored internal mental states.
3. **The "Cognitive Revolution" occurred in:**
   - A) 1920s
   - B) 1950s–1960s
   - C) 1980s
   - D) 2000s
   - *Hint:* Think post-WWII era.
   - *Explanation:* The revolution reintroduced study of mental processes.
4. **Who wrote *Cognitive Psychology* (1967)?**
   - A) Neisser
   - B) Freud
   - C) Watson
   - D) James
   - *Hint:* Known as father of cognitive psychology.
   - *Explanation:* Ulric Neisser formalized the field.
5. **Which discipline influenced cognitive psychology most?**
   - A) Linguistics
   - B) Geography
   - C) Sociology
   - D) Astronomy
   - *Hint:* Think of language and thought.
   - *Explanation:* Linguistics shaped theories of language and cognition.

Supplemental Resources

Readings

Read these two articles for more details about The History of Cognitive Psychology

- History of Cognitive Psychologyavailable at:https://psychology.iresearchnet.com/cognitive-psychology/#google_vignette
- Cognitive Psychology: Definition, Theories, & history at https://www.berkeleywellbeing.com/cognitive-psychology.html

Videos

Watch these videos to conceive a clear idea about the history of cognitive psychology:

- The History of Cognitive Psychology documentary (2011) https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://www.youtube.com/watch%3Fv%3D39yxGbqrvms
- A Brief History of Cognitive Psychology At https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://www.youtube.com/watch%3Fv%3DDLYVigxgHdA

Assignment: Check your progress

1. What was the importance of the computer to the development of cognitive psychology?

- Reflect on your online and classroom discussions and readings and summarize your response in one to two paragraphs

3. Group discussion

Here are some questions to answer as an extension of the course content (To be discussed in groups):

1. What is the significance of psychology for you?
2. What are the benefits of learning psychology?
3. What is the purpose of Cognitive psychology?

Web Resources

- Lecture 02-A Brief History of Cognitive Psychology YouTube · Introduction to Basic Cognitive Processes

https://www.youtube.com/watch?v=ls0AvPIPiyc

- Brief History of Cognitive Psychology | Early Thoughts .*YouTube* · PsychoTech Institute™

https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://www.youtube.com/watch%3Fv%3DUtz4t7FBy90&ved=2ahUKEwic2LqnktSIAxViTKQEHSnDAsgQwqsBegQILxAF&usg=AOvVaw1FSKgB1T8qU-_DCC9ClaeL

Course 4: Schools of Psychology: Main Schools of Thought

- **Course Scope**: An introduction to the general domain of Cognitive Psychology. (This course is an overview of the major historical schools of psychological thought leading up to the development of cognitive psychology.)
- **Course Learning Objectives**

  At the conclusion of this course, you should be able to:

  - Describe the basics of cognitive psychology
  - Summarize the history of psychology, focusing on the major schools of thought

Guiding Thoughts to the Course

1. How did the concept of Cognitive Psychology evolve historically?
2. What is the scope of Cognitive Psychology?

Psychology is a relatively young discipline, but psychologists have introduced many different ways of thinking about the human mind and behaviour since its inception. When psychology first emerged as a science separate from biology and philosophy, the debate over how to describe and explain the human mind and behaviour began. The different schools of psychology represent the major theories within the field of psychological science. The main schools of psychology are structuralism, functionalism, Gestalt, behaviourism, psychoanalysis, humanism, cognitivism, and biopsychology.

What is a School of Thought?

In psychology, a school of thought is a group that has similar opinions on philosophy, movements and intellect. It unifies and identifies those with common beliefs, traditions, or practices concerning a field of study or subject.

Major Schools of Thought in Psychology

Some of the major schools of thought that have influenced our knowledge and understanding of psychology to better understand its past and present are:

The Structuralist School of Psychology

Structuralism is widely regarded as the first school of thought in psychology. This outlook focused on breaking down mental processes into the most basic components[11]. Structuralism focused on reducing mental processes to their most basic elements. Structuralists

[11] https://www.verywellmind.com/structuralism-and-functionalism-2795248

used techniques such as introspection to analyse the inner processes of the human mind.While these methods were not understandably the most empirically rigorous, the structuralist school of thought played an important role in the development of experimental psychology.

Major thinkers associated with structuralism include **Wilhelm Wundt and Edward Titchener**

- **The Functionalist School of Psychology**

Functionalism formed as a reaction to the theories of the structuralist school of thought and was heavily influenced by the work of William James. It functioned on the mind's functions and adaptations.Instead of focusing on the mental processes themselves, functionalist thinkers were interested in the roles and functions of these processes. The functionalist schoolswas interested in the purpose of thoughts and behaviours, whereas structuralism was concerned with the elements that make up consciousness. While functionalism largely disappeared as a school of thought, its influence persisted in applied psychology, behaviourism, and educational psychology.

Functionalist thinkers, include **William James.John Dewey, James Rowland Angell, and Harvey Carr.**

- **The Gestalt School of Psychology**

Gestalt psychology was a school of psychology based upon the idea that people experience things as unified wholes. This approach to psychology began in Germany and Austria during the late 19th century in response to the molecular approach of structuralism Instead of breaking down thoughts and behaviour to their smallest elements, the Gestalt psychologists believed that one must look at the whole of experience. According to Gestalt thinkers, the whole is greater than the sum of its parts, a philosophy known as holism.[4]Some thinkers associated with the Gestalt school of thought included Max Wertheimer, Wolfgang Köhler, and Kurt Koffka.

- **The Behaviourist School of Psychology**

Behaviourism became a dominant school of thought during the 1950s.It is focused on *observable behaviour*. This school of thought suggests that environmental causes rather than internal forces can explain all behaviour. Examples of behavioural theories that emerged during this time include Classicalconditioning andOperant conditioning.The behavioural school of

psychology significantly influenced the course of psychology. Many ideas and techniques that emerged from this school of thought are still widely used today. It was based upon the work of thinkers such as **John B. Watson, Ivan Pavlov, and B. F. Skinner**.

⊙ The Cognitive School of Psychology

Cognitive psychology emerged during the 1950s, partly as a response to behaviourism. Critics of behaviourism noted that it failed to account for how internal processes impacted behaviour. Examples of theories that grew out of the cognitive school of thought include:

- **Stages of cognitive development:** A theory proposed by Jean Piaget, which suggested that children go through a series of progressive stages of intellectual development.
- **Sociocultural theory**: This theory, introduced by Lev Vygotsky, looked at how the interaction of cultural and social factors contributed to cognitive development.
- **Informational processing theory**: This theory suggests that the mind functions much like a computer to process and interpret information about the world.

This period is sometimes referred to as the ***"cognitive revolution"*** as a wealth of research on information processing, language, memory, and perception began to emerge.

COURSE SUMMARY

Course 4: Schools of Psychology: Main Schools of Thought

This course examines the **major schools of psychology** and their contributions to cognitive psychology:

- **Structuralism:** breaking down mental processes into basic elements through introspection.
- **Functionalism:** focusing on the purpose of mental processes in adapting to the environment.
- **Behaviourism:** studying observable behaviour and conditioning, rejecting introspection.
- **Psychoanalysis:** emphasizing unconscious motives and conflicts.
- **Humanism:** stressing personal growth, free will, and self-actualization.
- **Cognitive psychology:** focusing on how people perceive, remember, and think.

Each school contributed unique insights: structuralism and functionalism laid the groundwork for scientific study, behaviourism provided rigorous methods, psychoanalysis highlighted unconscious processes, and humanism emphasized holistic well-being. Cognitive psychology integrates these perspectives while centering on mental processes, making it a dominant approach in modern psychology.

TEST YOUR UNDERSTANDING
Course 4: Schools of Psychology

1. **Structuralism focused on:**
   - A) Purpose of behaviour
   - B) Breaking down mental processes
   - C) Unconscious motives
   - D) Observable actions *Hint:* Think of introspection. *Explanation:* Structuralism analyzed mental elements.
2. **Functionalism emphasized:**
   - A) Purpose of mental processes
   - B) Unconscious drives
   - C) Conditioning
   - D) Self-actualization
   - *Hint:* Think of adaptation.
   - *Explanation:* Functionalism studied how mental processes help survival.
3. **Behaviourism studied:**
   - A) Dreams
   - B) Observable behaviour
   - C) Free will
   - D) Self-growth
   - *Hint:* Think of conditioning experiments.
   - *Explanation:* Behaviourism focused on measurable actions.
4. **Psychoanalysis emphasized:**
   - A) Conscious thought
   - B) Unconscious motives
   - C) Learning
   - D) Social interaction
   - *Hint:* Freud's theory.
   - *Explanation:* Psychoanalysis explored unconscious drives.
5. **Humanism stressed:**
   - A) Conditioning
   - B) Self-actualization
   - C) Reflexes
   - D) Unconscious conflict
   - *Hint:* Think of Maslow's hierarchy.
   - *Explanation:* Humanism emphasized growth and free will.

Supplemental Resources

Readings

Read these two articles for more details about Schools of Thought in Psychology

- Schools of Thought: Meaning, Types & Behavioural, Psychology available at: https://www.studysmarter.co.uk/explanations/psychology/scientific-foundations-of-psychology/schools-of thought/
- Schools of thought in psychology at https://www.psychologs.com/schools-of-thought-in-psychology/

Videos

Watch these videos to conceive a clear idea about of Schools of Thought in psychology:

- Schools of Psychology available at https://www.youtube.com/watch?v=aRR6Gz1ov-8
- The 7 Primary Schools of Psychological Thought available at https://www.youtube.com/watch?v=qfUNfMui1O8

Assignment: Check your progress

1. Describe the major historical schools of psychological thought leading upto the development of cognitive psychology.

- Reflect on your online and classroom discussions and readings and summarize your response in one to two paragraphs

Course 5:Cognitive Psychology Theories

- **Course Scope**: An introduction to the general domain of Cognitive Psychology (This course is an overview of the majorcognitive psychology theories)

Course Learning Objectives

At the conclusion of this course, you should be able to:

- describe the major features of cognitive processes including perception, attention, memory, learning, reasoning, decision-making and problem solving;
- compare and contrast different theories of cognitive function;
- apply information acquired in the class to improve your own cognitive processes.

Guiding Thoughts to the Course

1. What are the important theories of cognitive psychology?

Course content

Many insights into human thinking and actions come from different psychology theories. For instance, behavioural theories show how conditioning helps with learning. By exploring these theories, you can better understand the history, current state, and future of psychology.

What is a Psychological theory?

Psychological theories are fact-based ideas that can explain certain aspects of human thoughts, behaviours and emotions. Psychology researchers create these theories to make predictions for future human behaviours or events that may take place if certain behaviours exist12. These theories are based on a hypothesis, which is backed by evidence. Thus, the two key components of a psychological theory are:

1. It must describe behaviour.
2. It must make predictions about future behaviours.

- **The Purpose of Psychological Theories**

You might wonder why it is important to study various psychology theories, particularly those that seem wrong or old-fashioned. However, theories:

- Provide valuable information about the history of psychology and the progression of thought on a particular topic.
- allow a deeper understanding of current theories. Each one helps contribute to our knowledge of the human mind and behaviour.

[12] https://www.simplypsychology.org/theories

- improve our understanding of how scientific explanations for behaviour and other phenomena in the natural world are formed, investigated, and accepted by the scientific community

- **Major Psychological T=heories**

There are five major types of psychological theories: behavioural, cognitive, humanistic, psychodynamic, and biological:

⊙ Behavioural Theories

Behavioural psychology, commonly referred to as behaviourism, is a learning theory that posits that all behaviours are developed through conditioning. This perspective entirely disregards internal mental processes, concentrating instead on the influence of environmental interactions, including associations, rewards, and punishments, in teaching and shaping behaviour. Prominent psychologists such as John **B. Watson** and **B.F. Skinner** advocated this approach, which was predominant in the field of psychology during the first half of the twentieth century.

In contemporary practice, behavioural techniques remain extensively employed by therapists to assist clients in acquiring new skills and behaviours..

⊙ Cognitive Theories

Cognitive theories in psychology explore internal processes such as motivation, problem-solving, and decision-making, aiming to clarify how the mind works and how thoughts influence feelings and actions. These theories suggest that our thoughts shape our perceptions and reactions, often likening the mind to a computer in terms of information processing. Additionally, they propose that we form mental structures, or schemas, to organize information, which in turn affects our interpretation of new data. Cognitive-behavioural therapy (CBT) is a key application of these theories, focusing on changing thoughts to improve emotional and behavioural issues.

⊙ Humanistic Theories

Humanistic psychology gained traction in the 1950s. This approach highlights the fundamental goodness of people. It focuses on free will and the natural desire for individuals to develop and achieve their full potential. Humanistic theories view people as whole beings, not just a collection of traits. Important concepts in this field include Maslow's hierarchy of needs, Rogers' idea of unconditional positive regard, and the significance of self-actualization.

- **Psychodynamic Theories**

Psychodynamic theories look at the hidden ideas that influence our feelings, attitudes, and personalities. These approaches aim to uncover the underlying reasons for unconscious actions. The unconscious mind holds thoughts, urges, emotions, and memories that we do not actively recognize. Psychodynamic theorists believe that this unconscious part still impacts our behaviour, even if we are not aware of it. These theories are closely associated with Sigmund Freud and his followers. The psychodynamic approach includes many of Freud's ideas, such as the belief that our adult behaviours stem from childhood experiences and that our personality consists of three components: the id, the ego, and the superego.

- **Biological Theories**

Biological theories in psychology explain human emotions and actions as being influenced by biological factors. In the debate of nature versus nurture, the biological viewpoint supports the idea of nature. These theories are based on the work of Charles Darwin, known for his ideas on evolution and genetics in psychology. A person looking at a psychological problem through a biological perspective might explore if physical injuries are leading to certain behaviours or if those behaviours are passed down through genetics.

COGNITIVE PSYCHOLOGY THEORIES

- **Cognitive Load Theory (CLT):**

It explains how working memory and long-term memory interact. It suggests that working memory can only hold a certain amount of information at once. When we exceed this limit, we feel overwhelmed, which hinders our ability to learn. Factors that contribute to this overload include complex information, distractions from irrelevant details, and the challenge of linking new knowledge to what we already understand.

This theory is significant for teaching and for presenting new information in a clear way (Bannert, 2002)[13].

⊙ C**ognitive Development:**

Developed by Jean Piaget in 1955, cognitive development theory explains that children progress through different stages (and sub-stages) as their thinking evolves. These theories aim to clarify how and why children's thinking and perception change as they grow. Many preschool and elementary school programs use this model as a foundation.

⊙ **Information Processing Theory**: This theory describes our mind as a computer. It sees the brain as a processor that takes inputs (from senses, attention, and memory) and produces outputs (behaviours) like a computer.

⊙ **Theory of Mind**: This is the skill to figure out what someone else is thinking. It means recognizing that others have different feelings and wants than we do. This helps us understand and anticipate how people will act.

⊙ **Dual Process Theory:**This theory suggests we have two types of thinking. One is fast, automatic, and relies on feelings and connections. The other is slow, careful, and uses logic (Gronchi&Giovannelli, 2018)[14]. It shows how we can make choices using both quick, instinctive thoughts and slower, more thoughtful reasoning.

1. **Cognitive PsychologyTheories**

- **Cognitive Load Theory (CLT):** This theory is about the relationship between working memory and long-term memory. It states that working memory has a limited capacity and once that capacity has been reached, we become overloaded and learning suffers. Things that make us feel overloaded include information complexity, irrelevant information that is distracting, and efforting to connect new information to things we already know. This theory has important implications for education and for presenting new information effectively (Bannert, 2002).
- **Cognitive Development:** Developed by Jean Piaget in 1955, cognitive development theory says that children go through several stages (and sub-stages) as their thinking processes develop. Cognitive development theories attempt to explain the mechanisms

[13]Bannert, M (2002).Managing cognitive load—recent trends in cognitive load theory.*Learning and Instruction* (2002) 139–146

[14]Gronchi, G., &Giovannelli, F. (2018). Dual process theory of thought and default mode network: A possible neural foundation of fast thinking. Frontiers in Psychology, 9, Article 1237. https://doi.org/10.3389/fpsyg.2018.01237

driving how and why children's thinking and perceiving change as they grow and mature. Many preschool and primary school programs are based on this model.

- **Information Processing Theory**: This theory describes our mind as a computer. It sees the brain as a processor that takes inputs (from senses, attention, and memory) and produces outputs (behaviours) like a computer.
- **Theory of Mind**: This is the ability to infer what is going on in someone else's mind, the ability to understand that someone else has different desires and emotions from yourself. This helps us to understand and predictothers' behaviour.
- **Dual Process Theory:** This theory says that we have two different systems of thought. One is quick, unconscious, intuitive, and based on associations and emotions. The other is slow, thoughtful, **conscious**, and based on reason (Gronchi&Giovannelli, 2018). This theory explains how we can make decisions based on both fast, instinctive thinking and slower, deliberative reason.

COURSE SUMMARY
Course 5: Cognitive Psychology Theories

This course explores the **major theoretical models** that explain cognitive processes:

- **Information-processing model:** compares the mind to a computer, with input (sensory data), processing (mental operations), and output (behaviour).
- **Schema theory:** mental frameworks help organize and interpret information, explaining how prior knowledge influences perception and memory.
- **Connectionism (neural networks):** cognition emerges from interconnected processing units, mirroring the brain's structure.
- **Dual-process models:** distinguish between fast, intuitive thinking and slow, analytical reasoning.

Students examine experimental evidence supporting these theories, such as studies on memory recall, problem-solving strategies, and decision-making biases. Applications are discussed in fields like education (improving learning strategies), therapy (understanding thought patterns), and artificial intelligence (designing intelligent systems).
By studying these theories, learners gain insight into how psychologists model the complexity of human thought and behaviour.

TEST YOUR UNDERSTANDING

Course 5: Cognitive Psychology Theories

1. **Information-processing model compares the mind to:**
   - A) A book
   - B) A computer
   - C) A machine
   - D) A library
   - *Hint:* Think input, storage, output.
   - *Explanation:* The model likens cognition to computer processing.
2. **Schema theory explains:**
   - A) Reflexes
   - B) Mental frameworks organizing knowledge
   - C) Genetic inheritance
   - D) Emotional states
   - *Hint:* Think of prior knowledge.
   - *Explanation:* Schemas guide perception and memory.
3. **Connectionism is based on:**
   - A) Neural networks
   - B) Reflex arcs
   - C) Classical conditioning
   - D) Psychoanalysis
   - *Hint:* Think brain-like processing.
   - *Explanation:* Connectionism models cognition through interconnected units.
4. **Dual-process models distinguish between:**
   - A) Conscious and unconscious drives
   - B) Fast intuitive vs. slow analytical thinking
   - C) Reflex and voluntary actions
   - D) Memory and perception
   - *Hint:* Think System 1 and System 2.
   - *Explanation:* Dual-process models explain two modes of reasoning
5. **Which theory emphasizes prior knowledge shaping perception?**
   - A) Schema theory
   - B) Behaviourism
   - C) Functionalism
   - D) Psychoanalysis
   - *Hint:* Think of frameworks.
   - *Explanation:* Schemas influence how we interpret new information.

Supplemental Resources

Readings

Read these two articles for more details about psychology theories

- Psychology Theories **& Conceptsavailable at** www.simplypsychology.org/theories
- Psychological Theories: Definition, Types, and Examples At https://www.verywellmind.com/what-is-a-theory-2795970

2. Videos

Watch these videos to conceive a clear idea about psychology theories and concepts

- Theories of Psychological Development Psy 30 and 32 at https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://www.youtube.com/watch%3Fv%3DpErWfN7fEwg&ved=2ahUKEwjWqf_LxZCJAxWt8gIHHesYKv4QtwJ6BAgJEAI&usg=AOvVaw06UoT_Rz9oWLEdluxvHFaN
- Theories in Psychology: A Refresher for AP Psych at https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://www.youtube.com/watch%3Fv%3Dl2QkB9OjSxk&ved=2ahUKEwjWqf_LxZCJAxWt8gIHHesYKv4QtwJ6BAgIEAI&usg=AOvVaw1ndTDp77VcHZWdRrnjY

3. Check your progress

1. What is the real meaning of a theory?
2. What is theory in your own words

- Reflect on your online and classroom discussions and readings and summarize your response in one to two paragraphs

4. Group discussion

Here are some questions to answer as an extension of the course content (To be discussed in groups):

- According to you, why should we learn about theories of psychological development?

Additional Web Resources

- Psychological Theories: Definition, Types, and Examples: at https://www.verywellmind.com/what-is-a-theory-2795970&ved=2ahUKEwinwui7xpCJAxVfUaQEHQP9NH0QFnoECCQQAQ&usg=AOvVaw0Ew20yipjhzS
- **What Are Psychological Theories? At** https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url
-

SEMESTER TWO

COGNITIVE PROCESSES

a) Perception
b) Attention andConsciousness
c) Memory
d) The Organization of Knowledge in theMind
e) Language
f) ProblemSolving andCreativity
g) DecisionMaking andReasoning

Course 6 : Cognitive Neuroscience

- **Course Scope**: An extension to the general domain of Cognitivepsychology (This course is an approach to studying andexplaining behaviour thatemphasizes mental

processes andknowledge)

- **Course Learning Objectives**

At the conclusion of this course, you should be able to:

- understanding the complementary roles of cognitive psychology and neuroscience in promoting a more holistic understanding of how the mind works;
- Understanding the nature of cognitive processes (i.e., attention's role in creating new memories).
- explain the scientific method as used in the fields of cognitive psychology and neuroscience,
- discuss experimental designs used in cognitive psychology.

Guiding Thoughts to the Course

1. What is cognitive neuroscience?
2. What is the field of cognitive neuroscience all about?

- **Course content**

The field of cognitive neuroscience studies how our brain affects mental processes. This course aims to give you a strong introduction to the field and its main areas, like memory, language, and cognitive control. We will focus on key theories, research methods, and the various tools we can use.

- **What is Cognitive Neuroscience?**

Cognitive neuroscience is a specialized area within the broader field of neuroscience. It is the scientific field that is concerned with the study of the biological processes and aspects that underlie cognition.[15] It addresses the questions of how cognitive activities are affected or controlled by neural circuits in the brain.

- Cognitive neuroscience is a branch of both neuroscience and psychology, overlapping with disciplines such as behavioural neuroscience, cognitive psychology, physiological psychology and affective neuroscience.
- Cognitive neuroscience relies upon theories in cognitive science coupled with evidence from neurobiology, and computational modelling.

[15] Gazzaniga, M. S., Ivry, R. B., & Mangun, G. R. (2002). Cognitive Neuroscience: The Biology of the Mind (2nd ed.). Norton & Company.

Cognitive Science vs Neuroscience

Cognitive science is the scientific study of thought, learning, and the human mind. It is an interdisciplinary field that combines ideas and methods from neuroscience, neuropsychology, psychology, computer science, linguistics, and philosophy

Neuroscience is the scientific study of the nervous system. It developed as a branch of biology, but quickly grew into an interdisciplinary field drawing from disciplines such as psychology, computer science, statistics, physics, philosophy, and medicine.

History of Cognitive Neuroscience

Cognitive neuroscience represents a multidisciplinary field that has developed from the foundations of neuroscience and psychology. Various phases within these disciplines have transformed the methodologies employed by researchers, ultimately contributing to the establishment of this field as a recognized area of study.

- **Ancient Greeks**Attempts to understand the mind and its operation when philosophers such as Plato and Aristotle tried to explain the nature of human knowledge.
- **The study of mind** remained the province of philosophy until the nineteenth century when experimental psychology developed. Wilhelm Wundt and his students initiated laboratory methods for studying mental operations more systematically
- **Experimental psychology:**Behaviourism took over, rejecting the idea of the mind. J. B. Watson and other behaviourists believed psychology should focus only on the link between visible stimuli and visible actions. Discussions about consciousness and mental images were excluded from serious scientific talks. In North America, behaviourism was the leading approach in psychology until the 1950s.
- **In the 1950s**, cognitive neuroscience began to gain momentum with the rise of cognitive psychology, which focused on the study of underlying mental processes.
- **A 1967 book** named Cognitive Psychology by Ulric Neisser reported the discussion of a 1956 meeting at the Massachusetts Institute of Technology, where George A. Miller, Noam Chomsky, and Newell & Simon presented important papers.
- **Cognitive neuroscience** began to integrate the newly-laid theoretical ground in cognitive science that emerged between the 1950s and 1960s with approaches in

experimental psychology, neuropsychology, and neuroscience. Neuroscience was formally recognized as a unified discipline in 1971.

- **In the 20th century**, new technologies have developed that are now essential to cognitive neuroscience methods. These include EEG, which started in 1920, MEG from 1968, TMS introduced in 1985, and fMRI that began in 1991.
- **Recently,**studies investigate how various brain regions interact. They use different technologies and methods to better understand brain functions, including computational techniques. Improvements in non-invasive brain imaging and data analysis have allowed researchers to employ more realistic stimuli and tasks in cognitive neuroscience research.

What is Cognitive Neuroscience Psychology?

Cognitive neuroscience looks at how the brain supports mental processes. It examines how neurons work together to create the complex structures of the human brain. Cognitive science combines techniques from cognitive psychology and artificial intelligence to develop and evaluate models of advanced thinking, like reasoning and language. Cognitive neuroscience connects these areas by linking complex mental functions to specific brain structures and neuron activities. One area of research involves using cognitive psychology tasks to gain insights into patients with brain injuries and to study how a healthy brain evolves with age.

Some definitions

• **Cognition** - The acquisition, storage, transformation, and use of knowledge.

• **Neuroscience** - Study of the structure and workings of the nervous system.

• **Cognitive neuroscience** - Study of how cognitive processes can be explained by the structure and function of the brain.

Supplemental Resources

Readings

Read these two articles for more details about Cognitive neuroscience:

- Cognitive Neuroscience available athttps://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://en.wikipedia.org/wiki/Cognitive_neuroscience&ved=2ahUKEwiY5ZizzqmLAxWpzQIHHWSACi8QFnoECEAQAQ&usg=AOvVaw0KRbGsQATo44XTtAcybGDt

- Cognitive Neuroscience Psychology Athttps://uwaterloo.ca/psychology/research/research-areas/cognitive-neuroscience-psychology

Videos

Watch these videos to conceive a clear idea about Cognitive neuroscience:

- Cognitive Neuroscience athttps://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://www.youtube.com/watch%3Fv%3DI52wVt7LntQ&ved=2ahUKEwjO-7GY0amLAxUw-AIHHYgGIRI4ChC3AnoECA0QAg&usg=AOvVaw0F0Inmyi9vlHpYUHLRS2_9
- Cognitive Neuroscience Methods at https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://www.youtube.com/watch%3Fv%3DI52wVt7LntQ&ved=2ahUKEwjO-7GY0amLAxUw-AIHHYgGIRI4ChC3AnoECA0QAg&usg=AOvVaw0F0Inmyi9vlHpYUHLRS2_9

4. Check your progress

- Reflect on your online and classroom discussions and readings and summarize your response in one to two paragraphs

5. Group discussion

Here are some questions to answer as an extension of the course content (To be discussed in groups):

1. What is the main aim of studying cognitive neuroscience?
2. What is an example of cognitive neuroscience in real life?
3. What is the difference between cognitive neuroscience and psychology?

Additional Web Resources

- **Cognitive Neuroscience - an overview**

https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://www.sciencedirect.com/topics/neuroscience/cognitive-neuroscience&ved=2ahUKEwiY5ZizzqmLAxWpzQIHHWSACi8QFnoECDwQAQ&usg=AOvVaw07T1zyAvT6HxpVnsWOfcza

Course 7:Perception

- **Course Scope**: An extension to the general domain of cognitive psychology (This course is an introduction to the study of perception, with a heavy emphasis on *visual* perception)
- **Course Learning Objectives**

At the conclusion of this course, you should be able to:

- Provide the terminology, background, and theories for sensation & perception.
- appreciate the theory and philosophy of perception
- review principles of sensation and perception
- review of each of the five major senses, with an emphasis on vision and hearing

Guiding Thoughts to the Course

3. What are the different typessensesyou know?
4. How do people perceive their environment?
5. Do you have any idea about the work of the different types of senses?

Course content

Perception is a complicated and changing process that affects how people see and understand their surroundings. It includes choosing, arranging, and interpreting sensory information to form meaningful views of reality. Factors like selective attention, cognitive biases, cultural and social influences, perceptual constancies, and personal differences shape perception. Grasping perception is important for understanding human behaviour and how decisions are made.

What is perception?

Perception (from Latin ***perceptio*** 'gathering, receiving') is the organization, identification, and interpretation of sensory information in order to represent and understand the presented information or environment.[16]

- The ability to perceive; mental grasp of objects, qualities, by means of the senses; awareness; comprehension[17]

- **Perception** in psychology can be defined as the sensory experience of the world, which includes how an individual recognizes and interpreter sensory information. This also includes how one responds to those stimuli. Perception includes these senses: vision, touch, sound, smell, taste, and proprioception.

Importance of Perception

- Perception is very important in understanding the human behaviour because every person perceives the world and approaches the life problems differently:

[16] Schacter D (2011). *Psychology*. Worth Publishers. ISBN 978-1-4292-3719-2.
[17]https://www.collinsdictionary.com/dictionary/english/perception#:~:text=a.,or%20the%20faculty%20for%20these

- Through perception we gain information about the properties and elements of the environment that are critical to our survival.
- It creates our experience of the world around us
- it allows us to act within our environment. ▸ iedunote.com/perception

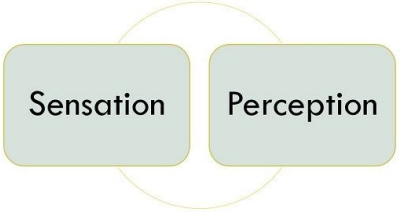
Types of Perception

- **Visual perception**: The ability to interpret and make sense of visual information, such as shape, color, and movement. For example, perceiving the difference between a tree and a rock based on their shape and texture.
- **Auditory perception**: The ability to interpret and make sense of auditory information, such as sound, pitch, and rhythm. For example, perceiving the difference between different musical instruments based on the sounds they produce.
- **Touch perception**: The ability to interpret and make sense of touch information, such as pressure, temperature, and texture. For example, perceiving the difference between a soft and a rough surface based on touch.
- **Taste perception**: The ability to interpret and make sense of taste information, such as sweet, sour, salty, and bitter. For example, perceiving the difference between different types of food based on taste.
- **Smell perception**: Also called olfaction, this is the ability to interpret and make sense of smell information, such as the scent of perfume, flowers, or food. For example, perceiving the difference between the smell of coffee and tea based on their unique scents.
- **Time perception**: The subjective experience of the passage of time. For example, perceiving that time passes quickly during an exciting event, but slowly during a boring one.
- **Pain perception**: This is the experience of both bodily pain transmitted from sense receptors in your body and psychological pain that is created from external experiences, such as **rejection**, but experienced internally (Eisenberger & Lieberman, 2004).
- **Proprioception**: Proprioception refers to the way in which our bodies interpret sensory signals from our muscles to understand the position of our bodies or where our limbs

are with respect to the rest of our bodies. For example, when you hold your arm out in front of you, stretch receptors in your muscles are indicating that they are being pulled which informs your brain that you have an outstretched arm.

Perception vs Sensation

Perception and sensation are related concepts, but they are not synonymous.



- **Sensation** refers to the process of detecting and responding to stimuli from the environment. It involves the stimulation of our sensory receptors, such as our eyes, ears, nose, tongue, and skin, which then send signals to the brain. Sensation is the raw, uninterpretedexperience of the world.
- **Perception**, on the other hand, is the union of all those sensations into one coherent experience.

The Perceptual Process

The perceptual process can be described in a sequence of steps:

1. **Stimulus:** The process begins with the presence of a stimulus, which can be anything in the environment that triggers the sensory organs.
2. **Selection:** Selective attention comes into play, as individuals choose which stimuli to focus on and which to ignore.
3. **Organization:** The selected sensory information is organized and structured to create meaningful patterns and interpretations.
4. **Interpretation:** Finally, the brain interprets the organized information based on pre-existing knowledge, beliefs, and past experiences.

Factors Affecting Perception

Perception is a complex process that allows us to interpret and make sense of the information that our senses receive. However, the way we perceive the world around us can be affected by a number of different factors. Some of the factors that can affect perception include:

- **The properties of the stimulus:** The physical characteristics of the stimulus, such as size, shape, colour, and brightness, can affect how an object is perceived.
- **The context of the stimulus:** The environment in which the stimulus is presented can affect how it is perceived.
- **The past experiences and expectations of the observer**: Our past experiences and expectations can affect how we perceive the world around us.
- **The observer's physical and physiological characteristics**: The physical and physiological characteristics of the observer can affect perception.
- **The observer's cognitive processes:** The cognitive processes of the observer, such as attention, memory, and reasoning, can also affect perception.
- **The task or goal of the observer:** The task or goal of the observer can also affect perception.[18]

Understanding these factors can help us to better understand how we perceive the world and can also have practical applications in fields such as psychology, design, and marketing.

COURSE SUMMARY
Course 6: Perception

Perception is the process by which sensory information is interpreted to form meaningful experiences of the world. This course begins with the basics of sensory systems — vision, hearing, touch, taste, and smell — and explains how raw stimuli are transformed into neural signals. It emphasizes the difference between **sensation** (the detection of stimuli) and **perception** (the interpretation of those stimuli).

[18] https://humenbehaviour.blogspot.com/2023/01/factors-affecting-perception.html

Students explore **visual perception**, including depth cues, color vision, and Gestalt principles such as figure-ground, similarity, and closure. **Auditory perception** is studied through pitch, loudness, and speech recognition. The course also examines how perception is influenced by **top-down processing** (expectations, prior knowledge) and **bottom-up processing** (data-driven input).

Practical examples include optical illusions, which reveal how the brain organizes ambiguous information, and real-world applications such as design, advertising, and safety systems. By the end, learners understand perception as an active, constructive process shaped by both sensory input and cognitive expectations.

TEST YOUR UNDETRSTANDING
Course 6: Perception

1. Perception is best defined as:
    - A) Detecting raw sensory input
    - B) Interpreting sensory information
    - C) Reflexive motor response
    - D) Emotional reaction
2. Which principle explains why we see patterns as wholes rather than parts?
    - A) Behaviorism
    - B) Gestalt principles
    - C) Schema theory
    - D) Psychoanalysis
3. Bottom-up processing relies on:

- A) Prior knowledge
- B) Data-driven input
- C) Expectations
- D) Emotional states

4. Depth perception depends on:
   - A) Binocular cues
   - B) Reflexes
   - C) Memory
   - D) Language
5. Optical illusions demonstrate:
   - A) Errors in sensation
   - B) Active construction of perception
   - C) Memory distortion
   - D) Emotional bias

Supplemental Resources

Read these two articles for more details about the concept of Perception:

- Perception: The Sensory Experience of the World-. available at:

https://www.verywellmind.com/perception-and-the-perceptual-process-2795839

Perception: Definition, Examples, & Types at https://www.berkeleywellbeing.com/perception.html

Videos

Watch these videos to conceive a clear idea about Perception:

- Perception in Psychology | Definition, Importance & Types at

https://study.com/academy/lesson/video/what-is-perception-in-psychology-

- The Psychology of Perception - Simplest Explanation Ever athttps://www.youtube.com/watch?v=pgtbZhAf5Bo

Assignment: : Check your progress

1. Can you define perception in your ownwords?
2. Can you describe an example of perception that happened with you?
3. Compare your answer with your peers.

- Reflect on your online and classroom discussions and readings and summarize your response in one to two paragraphs

6. Group discussion

- Describe the importance of perception in our daily life.

Supplemental Resources

1. What is Perception? – General Psychology - UCF Pressbooks at https://pressbooks.online.ucf.edu/lumenpsychology/chapter/reading-what-is-perception/
2. Perception | Definition, Process, Examples, Differences, at https://www.britannica.com/topic/perception
3. Perception at https://en.wikipedia.org/wiki/Perception
4. Perception Psychology: Exploring Key Perception Theories at

   https://www.betterhelp.com/advice/psychologists/perception-psychology-definition-and-how-we-see-things/

Project Assignment

Identifying yourperception

- Self-perception is the process of observing and interpreting one's own behaviours, thoughts, and feelings, and using those observations and interpretations to define oneself (Robak, 2001)

Discussion Questions

1. What core beliefs do you hold? How might these beliefs limit or enable you and your colleagues at work?
2. How do you react to people from different backgrounds? Do you hold stereotypes or assumptions about a particular social group?
3. Do your words and actions actually reflect your intentions?
4. Do you put yourself in the shoes of the other person and empathize with their situation, even if you do not relate to it?
5. Analyse your answers:***What can you do toimprove yourSelf-perception?***

Course 8:Attention and Consciousness

- **Course Scope**: An extension to the general domain of cognitive psychology (This course is an introduction to the study of attention)
- **Course Learning Objectives**

At the conclusion of this course, you should be able to:

- Know how the process of attention takes place
- Understand what is meant by consciousness and attention

Guiding Thoughts to the Course

1. Can you defineattention?
2. Can youdefineconsciousness?
3. Can you make a difference between them?

Course Content

The concept of Attention is studied in **Cognitive Psychology** with focus on explaining how we process the environmental information with the help of our sensory receptors.

Attention defined

- A state in which cognitive resources are focused on certain aspects of the environment rather than on others and the central nervous system is in a state of readiness to respond to stimuli. [19]

Nature of Attention

The following are some of the nature of attention:

- Attention is a mental process.
- There can be no attention in the absence of interest.
- The thought of conscious life is impossible in the absence of attention.
- Attention creates readiness for performing a work.
- Attention is a selective process.

Characteristics of attention

- ***Attention is focusing consciousness on one object***. One object is the focus of attention. All other objects are in the margin of attention.
- ***Attention is always changing***. Attention is dynamic and not a stable state. It is an active process that cannot stay focused on a single object for long, as it naturally shifts between different aspects of that object.
- ***Attention increases the clarity of the object***. When we pay our attention to an object, we clearly perceive what it is.

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•***Attention is selective***. We can prioritize certain objects over others, focusing on those with particular advantages while overlooking others, even when we are consciously attentive..

•***Attention is a state of preparedness*** where the muscles and sense organs get ready themselves for taking in information from various stimuli.

•***Attention is cognitive, affective and conative***. Mental activity primarily falls into three categories: cognition, emotion, and volition. Engaging in knowing, feeling, or acting requires focusing on a specific object or subject. Attention is a fundamental component shared by all these processes, encompassing all three dimensions of conscious experience.

Types of Attention in Psychology

Although attention is a single cognitive process, psychologists have found that people pay different kinds of attention.

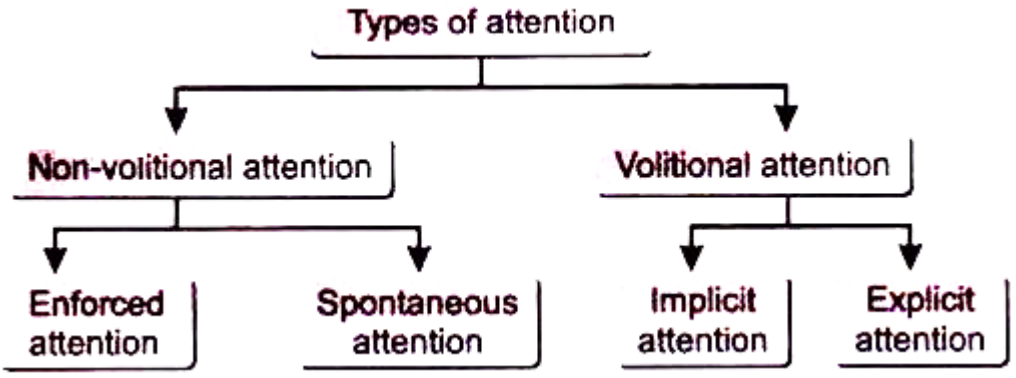

Fig 2: Types of Attention in Psychology

Ross classifies attention into two types: Non-Volitional (Involuntary) and Volitional (Voluntary).

- **Non-Volitional (Involuntary) Attention:** This type of attention happens without any conscious choice. It can be activated by instincts, known as enforced attention, or by emotions, referred to as spontaneous non-volitional attention. For instance, a person might notice someone of the opposite gender or a mother might instinctively focus on her crying child.
- **Volitional (Voluntary) Attention:** This type requires conscious effort and willpower to focus on tasks or solve problems. It is less automatic than non-volitional attention. Examples include concentrating while solving a math problem or focusing during an exam.

Attention can also be categorized based on our needs or the situations we encounter.The different types of attention are the following:

a) **Focused attention** refers to focusing on a single stimulus.
b) **Selective attention** refers to paying attention to one stimulus, even if there are distractions.
c) **Sustained attention** refers to putting attention on a stimulus for an extended period.
d) **Divided attention** refers to the attention that is directed to more than one stimulus at a time.
e) **Alternating attention** occurs when attention switches back and forth between different stimuli.
f) **Visual Attention:** Visual attention involves using the eyes to focus on specific details. It highlights what we see while ignoring other distractions in the environment. This type of attention is important in areas like advertising and reading.
g) **Auditory Attention:** Auditory attention focuses solely on what we hear. For instance, listening to an important announcement is a good example of this type of attention. Both auditory and visual are complementary to process information.

- **Factors affecting attention**

Several factors can affect attention. Each of these factors can increase or decrease a person's attention to a certain object, person or concept.

These could be classified under two broad categories namely external factors and internal factors.

- **External factors:** Factors which are present outside the stimuli or situation refer to external factors. These can also be called as objective factors. This involves: motion, size, intensity, novelty, emotion, personal significance and social cues.

a) Motion: Adults and children are more likely to pay attention to an object when there is motion involved. (Ormrod, 2008)[20]. Example: Children are more drawn to toys and objects that move such as toy cars, moving dolls.

b) **Size**: Size has an effect on attention. Objects or text that is larger gain more attention than normal or small objects. At the same time very small objects too draws our attention when compared to normal size. When a dwarf man is seen, people will have a tendency to look at the person.

c) **Intensity**: Intense objects attract our attention. Loud sound, bright objects and strong smell draws our attention easily.

d) **Contrast**: Anything that is different from its surroundings is contrast. A black dust in white sugar draws more attention

[20] Ormrod, J, E (2008) . Human learning. fifth edition Upper Saddle River, N.J. : Pearson/Merrill Prentice Hall

e) **Novelty**: New things attract people more. Students pay more attention to a new way of teaching or a new teacher. "Stimuli that are novel or unusual tend to draw people's attention." (Ormrod, 2008)

f) **Emotion**: Words with strong emotional connections seem to gain more attention than others.

g) **Personal Significance**: A person is more likely to pay attention to a person or concept that has a personal significance to them. Example: If a person suffers from a disease, they are more likely to pay attention to a lecture about that disease, because they know how it could affect their lives.

h**) Social cues:** "People are more likely to pay attention to things they see others looking at or reacting to (Ormrod, 2008, p. 173)".

- **Internal factors:** Internal factors are concerned with the individual. Hence it is also called as subjective factors. The factors are:

a) Interest: People always give more attention to stimuli or situation in which they are interested. Interesting things draws our attention immediately.

b) **Desire**: People pay attention to things, which they desire.

c) **Motives**: Basic motives are so powerful and are important in drawing attention. A person who is hungry will pay more attention to places where food is available.

d) **Goal**: People will be paying attention to activities that will help them to achieve their goal. Students pay more attention to studies before examination as their goal is to pass/ excel in the examination

e) **Past experience:**Previous experiences with individuals significantly shape our attention; for example, if we view someone as sincere, we are more likely to focus on their communication than on those who have not shown sincerity.

Consciousness

The words "conscious" and "consciousness" are umbrella terms that cover a wide variety of mental phenomena. Both are used with diversity of meanings, and to particular mental states and processes.

Definition of Consciousness

- The Cambridge English Dictionary defines consciousness as "the state of understanding and realizing something".[21]

- **Consciousness**, at its simplest, is awareness of internal and external existence[22]

What Are theLevels of Consciousness?

The different levels of consciousness illustrate the complexity of the human mind, highlighting how various types of awareness and memory function together to shape our thoughts, behaviours, and experiences. Understanding these distinctions can provide insight into how we process information and how our past influences our present:

1. Conscious: This refers to the state of being aware of and able to think about your thoughts, feelings, and surroundings. It encompasses everything you are currently experiencing and processing, including your immediate thoughts, perceptions, and sensations. For example, when you are engaged in a conversation, your conscious mind is actively involved in understanding the words being spoken, formulating responses, and interpreting non-verbal cues.

2. Preconscious: This level contains information that is not currently in your conscious awareness but can be easily accessed when needed. It acts as a bridge between the conscious and unconscious mind. For instance, you may not be actively thinking about your childhood friend, but if someone mentions their name or you see a photo, you can quickly recall memories associated with them. The preconscious mind holds memories, knowledge, and experiences that are readily retrievable.

3. Unconscious: The unconscious mind consists of thoughts, memories, and desires that are not accessible to conscious awareness. These can include repressed memories, unresolved conflicts, and instinctual drives. While you may not be aware of these elements, they can still influence your behaviour and emotions. For example, a person may have an unconscious fear of dogs due to a traumatic experience in childhood, even if they do not consciously remember the event.

4. Non-conscious: This term refers to processes and functions that occur automatically and do not require conscious thought or awareness. These include physiological processes such as breathing, digestion, and heart rate regulation. Non-conscious functions are essential for survival and operate without the need for conscious intervention. For example, you do not need

[21] https://en.wikipedia.org/wiki/Cambridge_English_Dictionary
[22] https://en.wikipedia.org/wiki/Consciousness

to consciously think about your heart beating or your lungs breathing; these processes happen automatically.

5. Subconscious: The subconscious mind is similar to the preconscious in that it contains information that is not currently in your immediate awareness but can be accessed later. It includes memories, experiences, and learned behaviours that influence your thoughts and actions without you being fully aware of them. For instance, a person may have a subconscious bias towards a particular group of people based on past experiences, which can affect their interactions without them realizing it.

⊙ Functions of Consciousness

Consciousness serves many biological and social roles, playing a crucial part in our survival and interaction with the world around us. Consciousness enables us to:

- ***process and understand information from our environment***, allowing us to interpret sensory inputs and make sense of complex stimuli. This cognitive function is essential for navigating our surroundings, recognizing potential threats, and identifying opportunities for growth and development
- ***weigh options In terms of decision-making***, by evaluating different scenarios and predicting outcomes, we can engage in problem-solving and critical thinking, which are essential skills in both personal and professional contexts.
- ***prioritize our goals, values, and relationships,*** guiding our actions and behaviours in alignment with our beliefs and aspirations. This self-awareness fosters a sense of identity and purpose, enabling us to connect with others on a deeper level and contribute to the social fabric of our communities.
- ***share our thoughts, feelings, and experiences with others***, fostering empathy and understanding. This social dimension of consciousness is crucial for building relationships, resolving conflicts, and creating a sense of belonging within groups.
- ***reflect on our experiences***, learn from them, and pass on valuable insights to future generations. This process of cultural evolution is essential for the advancement of societies, as it allows for the accumulation of wisdom and the adaptation of practices to meet changing circumstances.

COPURSE SUMMARY
Course 8: Attention and Consciousness

Attention is the cognitive process of selectively focusing on certain stimuli while ignoring others. This course explores **selective attention**, **divided attention**, and **sustained attention**, showing how limited cognitive resources are allocated. Theories such as Broadbent's filter model and Kahneman's capacity model are introduced to explain how attention operates.

Consciousness is studied as awareness of self and environment. Students examine different states of consciousness: wakefulness, sleep stages, dreaming, and altered states (meditation, hypnosis, drug-induced states). The course also highlights the relationship between attention and consciousness, showing how awareness depends on selective focus.

Applications include multitasking in daily life, the impact of distractions on driving, and mindfulness practices that enhance attention. Learners come to appreciate attention and consciousness as central to human experience, shaping how we interact with the world.

TEST YOUR UNDERSTANDING

Course 8: Attention and Consciousness

1. Selective attention allows us to:
    - A) Process all stimuli equally
    - B) Focus on relevant stimuli
    - C) Eliminate distractions completely
    - D) Store information permanently
2. Divided attention refers to:
    - A) Focusing on one task
    - B) Splitting focus across tasks
    - C) Ignoring all stimuli

- D) Conscious awareness

3. Broadbent's filter model explains:
   - A) How memory is stored
   - B) How irrelevant stimuli are filtered
   - C) How language is acquired
   - D) How emotions are processed
4. REM sleep is associated with:
   - A) Deep unconsciousness
   - B) Dreaming
   - C) Memory loss
   - D) Reflex activity
5. Consciousness is defined as:
   - A) Reflexive behavior
   - B) Awareness of self and environment
   - C) Emotional regulation
   - D) Automatic processing

⊙ 67Supplemental Resources

⊙ Readings

Read these two articles for more details about attention and consciousness:

⊙ Attention and consciousness –Scholarpediaat

http://www.scholarpedia.org/article/Attention_and_consciousness

- The relationship between attention and consciousness: an expanded taxonomy and implications for 'no-report' paradigms at https://royalsocietypublishing.org/doi/10.1098/rstb.2017.0348

Videos

Watch these videos to conceive a clear idea about:

- **Psychology of Attention Explained | Selective Attention, Inattentional Blindness, & Change Blindness**

  https://www.bing.com/videos/riverview/relatedvideo?&q=attention+and+consciousness&&mid=7A6587F79CC8283009DA7A6587F79CC8283009DA&mmscn=mtsc&aps=0&FORM=VRDGAR Introduction to learning theories

- **Consciousness and Attention**available at https://www.bing.com/videos/riverview/relatedvideo?&q=attention+and+consciousness&&mid=680BB8CD08303DB5531C680BB8CD08303DB5531C&mmscn=mtsc&aps=3&FORM=VRDGAR

Assignment: Check your progress

1. Compare both Consciousness and Attention.
2. Explain theirmechanisms in your own words.

- Reflect on your online and classroom discussions and readings and summarize your response in one to two paragraphs

Group discussion

Here are some questions to answer as an extension of the course content (To be discussed in groups):

- Does paying attention enable you to make better decisions?

Resources

- Attention and consciousness: two distinct brain processes

https://www.cogsci.msu.edu/DSS/2007-2008/Koch/koch-tsuchiya-07.pdf

- Attention and consciousness - Duke University
- https://people.duke.edu/~fd13/2010/De_Brigard_Prinz_2010_WIREs.pdf
- Attention **vs** Consciousness

https://www.bing.com/search?q=attention+vs+consciousness&FORM=QSRE6

- **Relation between** attention and consciousness

https://www.bing.com/search?q=relation+between+attention+and+consciousness&FORM=QSRE7

- Attention and consciousness

https://www.bing.com/search?q=attention+and+consciousness+pdf&FORM=QSRE8

- Attention and consciousness **theory**

https://www.bing.com/search?q=attention+and+consciousness+theory&FORM=QSRE9

- Attention and consciousness **relationship**

https://www.bing.com/search?q=attention+and+consciousness+relationship&FORM=QSRE10

Course 9:Memory and Forgetting

- **Course Scope**: An extension to the general domain of cognitive psychology (This course is an introduction to the study of attention)
- **Course Learning Objectives**

At the conclusion of this course, you should be able to:

- Discuss the basic functions of memory
- Describe the stages of memory storage
- Know how the process of memory takes place

Guiding Thoughts to the Course

1. Have you ever struggled to remember things?
2. What is memory and why is it important??
3. What are the different types of memory?

- **CourseContent**

Memory is essential for daily routines, work, social interactions, learning, decision-making, and communication. Memory problems can hinder independent living. This underscores the importance of memory and the need for further research in this area.

- **Memory Defined**
  - Memory is referred to as the process of encoding, storing, and retrieving information in psychology. We can form relationships, adjust to new circumstances, learn from experience, and make sense of the world around us thanks to this intricate system. Everything we remember is included in memory, and it affects almost everything we do[23].
  - Memory is defined in psychology as the faculty of encoding, storing, and retrieving information (Squire, 2009)[24]
  - Memory is the encoding, storage, and retrieval in the human mind of past experiences[25].
  - Memory is the faculty of the mind by which data or information is encoded,

[23] https://psychologydictionary.org/memory/
[24] Squire L. R. (2009). Memory and brain systems: 1969–2009. J. Neurosci. 29 12711–12716. 10.1523/jneurosci.3575-09.2009 [DOI] [PMC free article] [PubMed] [Google Scholar]
[25] https://www.britannica.com/science/memory-psychology

stored, and retrieved when needed. It is the retention of information over time for the purpose of influencing future action.[26]

KeyConcepts and Terminologies

- **Encoding**: The process by which we transform what we perceive, think, or feel into an enduring memory.
- **Storage**: The process of maintaining information in memory over time.
- **Retrieval**: The process of bringing to mind information that has been previously encoded and stored.
- **Capacity** concerns how much information can be stored.
- **Duration** refers to the period of time information can last in-memory stores.

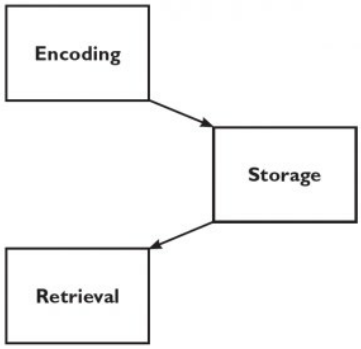

Fig 3: Memory Processes: Encoding, Storage, and Retrieval

Types of Memory

The basic types of memory are sensory memory, short-term memory (STM) and long-term memory (LTM).

⊙ Sensory Memory

The senses gather information from our surroundings and first send it to sensory memory, which keeps a short impression of what we detect. This memory constantly receives data, but most of it goes unnoticed and stays for only a brief moment before being replaced by new information. If you focus on any of this information, it moves into short-term memory (STM). Sensory memory lasts only a short time, about ¼ to ½ of a second. Each sense has its own storage in sensory memory, so a taste is remembered as a taste, a touch as a touch, and so on.

[26] Sherwood, L (2015). Human Physiology: From Cells to Systems. Cengage Learning. pp. 157–162. ISBN 978-1-305-44551-2.

⊙ **Short-Term Memory (STM).**

Short-term memory holds information for a brief period, typically about 30 seconds. It can manage around seven pieces of information, give or take two (meaning one person might remember nine items while another might only recall five). To keep this information from fading, it needs to be repeated, either silently or out loud. However, if new information enters, it can push out what is already there, a process called displacement.

A typical example of short-term memory is when you need to remember a set of numbers, like a phone number, and repeat it to yourself until you remember it.

⊙ **Long-Term Memory (LTM)**

The duration and capacity (how much the LTM can store) are unlimited. There are three types of LTM -- episodic, semantic and procedural memory.

- ***Episodic memory*** is the memory of events in your life. For example, what you did in the weekend, everything you did on holiday …. Episodic memory contains information on what, when and where an event happened.
- ***Semantic memory*** is the collection of knowledge you have gained throughout your life. For example, the capital of France is Paris.
- ***Procedural memory:*** procedural memory is your memory of how to do things, such as ride a bicycle or play the piano.
- ***Prospective memory***, mentioned in the introduction, is a type of memory that lets us remember and carry out tasks that we have planned for the future. An example of prospective memory is, 'when I get home I need to revise for my exam next week, and do my homeworks.'

Memory Models in Psychology

There are two major models of memory. They are the multi-store model of memory and the working memory model.

- **Multi-store Model of Memory**

In 1968, Richard Atkinson and Richard Shiffrin introduced the multi-store model of memory (MSM), outlining three memory stores: sensory memory, short-term memory

(STM), and long-term memory (LTM). Information flows linearly through these stores, each with distinct encoding methods, storage capacities, and durations. Information first enters sensory memory, and then moves to STM with attention and finally to LTM through elaborative rehearsal, which connects new information to existing knowledge. This method is more effective for retention than maintenance rehearsal. We can retrieve information from LTM back to STM when needed.

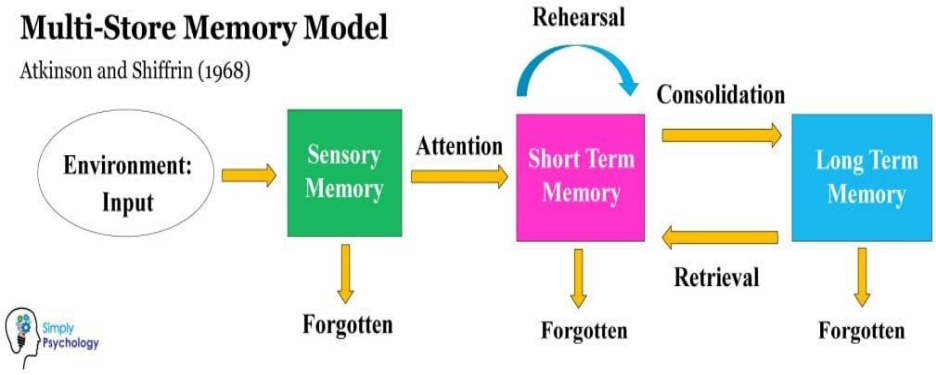

Fig 4. - Multi-store model of memory.

- **The Working Memory Model**

Baddeley and Hitch's Working Memory Model, developed in 1974, clarifies short-term memory as a complex system rather than a single unit. It includes the 'central executive', 'visuo-spatial sketchpad', 'phonological loop', and 'episodic buffer'. The central executive coordinates the components, while the visuo-spatial sketchpad temporarily stores visual and spatial information. The phonological loop manages verbal information, consisting of a phonological store for verbal data and an articulatory loop for inner speech. The episodic buffer integrates information from all components and long-term memory.

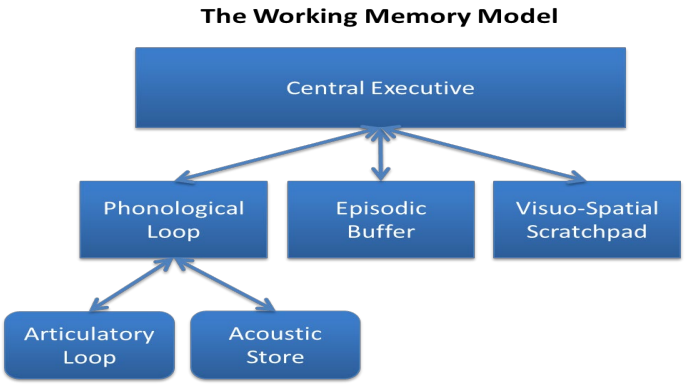

Fig 5. Working memory model

- **Memory Issues**

This section below will introduce two explanations for forgetting in psychology: interference and retrieval failure.

a) Interference

The interference theory of forgetting describes why people forget things stored in long-term memory. It suggests that forgetting happens when different memories clash and disrupt each other. In simple terms, people forget when two bits of information compete with one another.

b) **The retrieval failure theory of forgetting**,

It is also called cue-dependent forgetting. This concept describes why people cannot remember things without hints. When we first learn something, we also remember related signals. If those signals are missing when we try to remember, we might struggle to recall the information.

- **Tips on how to improve memory**

A strong memory is very helpful in everyday life: Whether in preparing for an exam, recalling a speech, or just remembering a person's name, Here are tips to boost memory[27]:

- ***Focus on the task at hand:*** when we focus and pay attention to something, it gets transferred from the STM to the LTM
- ***Do not cram information:*** taking in information regularly over a period of time is better than trying to cram information into the brain in a short space of time.
- ***Chunking:*** organize information by grouping related concepts or topics together.
- ***Make use of learning techniques*** - try to find ways that will help you to remember, such as coming up with acronyms to help you to remember important points.
- ***Relate the information to you:*** ask yourself how can you connect what you are learning to yourself. When we give information meaning this is called elaborative rehearsal which is how information from the STM gets transferred to the LTM.
- ***Test yourself:*** when you test yourself on what you have learned you will learn more
- ***Make associations between new and old information:*** when you are trying to learn

[27] https://www.mayoclinic.org/healthy-lifestyle/healthy-aging/in-depth/memory-loss/art-20046518

something new, try to think of how it relates to what you already know.

- ***Visual cues:*** create graphs and charts to help you to remember information, such as the memory model charts in this explanation!
- ***Write not type:*** when we write down information by hand we remember it much better than when we type it. This is because as writing by hand takes longer, we naturally be more selective as to what we write down, focusing only on the main points to be learned.
- ***Say information aloud:*** when we read out information to ourselves the actions of speaking and hearing ourselves help the information to be transferred to the LTM.

➢ meet changing circumstances.

COURSE SUMMARY
Course 9: Memory

Memory is the system for encoding, storing, and retrieving information. This course introduces the **three stages of memory**: sensory memory, short-term memory, and long-term memory. **Working memory** is emphasized as the active system for holding and manipulating information.

Students study processes of **encoding** (transforming input into memory), **storage** (maintaining information), and **retrieval** (accessing stored knowledge). The course covers forgetting theories such as decay, interference, and retrieval failure, as well as memory distortions like false memories.

Strategies for improving memory — rehearsal, chunking, mnemonic devices — are discussed. Real-world applications include studying techniques, eyewitness testimony, and memory disorders such as Alzheimer's disease. By the end, learners understand memory as a dynamic, reconstructive process rather than a perfect recording.

TEST YOUR UNDERSTANDINGF
Course 9: Memory

1. Working memory is responsible for:
    - A) Long-term storage
    - B) Holding and manipulating information
    - C) Sensory detection
    - D) Emotional regulation
2. Encoding refers to:
    - A) Storing information permanently
    - B) Transforming input into memory
    - C) Forgetting information
    - D) Retrieving knowledge
3. Forgetting due to interference occurs when:
    - A) Information decays naturally
    - B) New info disrupts old info
    - C) Retrieval cues are strong
    - D) Memory is rehearsed
4. Chunking improves memory by:
    - A) Expanding capacity
    - B) Eliminating distractions
    - C) Reducing rehearsal
    - D) Increasing forgetting
5. False memories show that:
    - A) Memory is a perfect recording
    - B) Memory is reconstructive
    - C) Memory is unlimited
    - D) Memory is unconscious

6

- **77Supplemental Resources**
- **Readings**

Read these two articles for more details about the mechanism of memory:

- What Is Memory? How memories help us—and why they sometimes fail athttps://www.verywellmind.com/what-is-memory-2795006
- How memories form and how we lose them at https://www.bing.com/videos/riverview/relatedvideo?&q=a)+memory&qpvt=a)+memory&mid=31A79399927CD9E1C35C31A79399927CD9E1C35C&mmscn=mtsc&aps=6&FORM=VRDGAR
- at https://royalsocietypublishing.org/doi/10.1098/rstb.2017.0348

- **Videos**

Watch these videos to conceive a clear idea about:

- How memories form and how we lose them at https://www.bing.com/videos/riverview/relatedvideo?&q=a)+memory&qpvt=a)+memory&mid=31A79399927CD9E1C35C31A79399927CD9E1C35C&mmscn=mtsc&aps=6&FORM=VRDGAR
- available at https://www.bing.com/videos/riverview/relatedvideo?&q=attention+and+consciousness&&mid=680BB8CD08303DB5531C680BB8CD08303DB5531C&mmscn=mtsc&aps=3&FORM=VRDGAR

- **Assignment: Check your progress**

- Reflect on your online and classroom discussions and readings and summarize your response in one to two paragraphs

- **Group discussion**

Here are some questions to answer as an extension of the course content (To be discussed in groups):

1. Can you think of more than one kind of memory that you have drawn upon?
2. Why can you remember an event years ago, but forget what your instructor said seconds ago?
3. Is it true that some memories can last a lifetime?
4. Is it true that “you never forget how to ride a bicycle

Course 10: Knowledge Representation in the Mind

- **Course Scope**: An extension to the general domain of cognitive psychology (This course is an introduction to knowledge representation in the brain)

- **Course LearningObjectives**

At the conclusion of this course, you should be able to:

- . Grasp theoretical concepts related to how knowledge is represented in the human mind and brain.
- Analyze different views on how mental representations are stored, retrieved, and their nature and existence.
- Evaluate the connections between real-world findings and how those findings are understood in relation to knowledge representation and dynamic processing.

Guiding Thoughts to the Course
1. How is knowledge represented in the mind?
2. What are mental representations of knowledge?
3. What is the representation theory of the mind?
4. What are the knowledge representations in humans?

- **CourseContent**

Knowledge Representation is about how we encode, store, and retrieve information in our minds. It looks at the mental structures and processes that help us learn, organize, and use knowledge effectively.

- **What is Knowledge Representation?**

Knowledge representation involves the ways in which information is encoded, stored, and retrieved in the human mind. It focuses on the mental structures and processes that enable us to acquire, organize, and use knowledge effectively[28]

- **What is knowledge?**

According to Merriam-Webster online dictionary, knowledge is “the range of one’s

[28]https://library.fiveable.me/cognitive-psychology/unit-8

information and understanding" and "the circumstance or condition of apprehending truth or fact through reasoning"[29].

Forms of knowledge

Human thinking skills depend on knowledge. How do people find their way in the world? How do they tackle problems, understand what is around them, and decide what to do?

Knowledge, which is how we mentally picture the world, helps answer all these question including declarative (facts and concepts), procedural (skills and abilities), and episodic (personal experiences)

Knowledge plays a crucial role in cognitive processes such as perception, learning, problem solving, decision-making, and language comprehension.

Key Concepts and Theories

a) Schema theory

It proposes that knowledge is organized into structured mental frameworks called schemas, which guide information processing and interpretation. Schemas are activated and updated based on new experiences and information, allowing for efficient encoding and retrieval of knowledge

b) Mental models

They are internal representations of external systems or phenomena that allow individuals to simulate and reason about their behaviour and outcomes. They are constructed through interaction with the environment.

c) Semantic networks

They represent knowledge as a network of nodes (concepts) and links (relationships) that capture the meaning and associations between concepts. Spreading activation theory suggests that activation spreads from one node to related nodes in the network, facilitating information retrieval and inference

d) Propositional representations

They encode knowledge as a set of propositions or statements that express facts, beliefs, and rules about the world; They are used in formal reasoning, problem-solving, and knowledge-based systems (expert systems, theorem provers)

e) Connectionist models, also known as **neural networks,**

Theyrepresent knowledge as patterns of activation across a network of

[29] https://www.merriam-webster.com/

interconnected processing units (neurons). They can learn and adapt their representations through experience, using learning algorithms that adjust the connections between units.

Types of Knowledge Representations

There are five main types of knowledge representation in the mind. They are listed as:

a) Symbolic representations

They use discrete symbols (words, numbers, logical expressions) to represent concepts, relationships, and rules. They are explicit, structured, and can be manipulated using formal logic and reasoning techniques

b) Sub symbolic representations

They encode knowledge in distributed patterns of activation across a network of processing units, without explicit symbols or rules. Examples of subsymbolic representations include neural networks, self-organizing maps, and associative memories

c) Hybrid representations

They combine symbolic and subsymbolic approaches to leverage the strengths of both. Examples of hybrid representations include neuro-symbolic systems, probabilistic graphical models, and cognitive architectures (ACT-R, Soar)

d) Spatial representations

They encode knowledge about the spatial properties and relationships of objects and environments. Examples of spatial representations include cognitive maps, mental rotation, and spatial schemas

e) Temporal representations

They encode knowledge about the temporal properties and relationships of events and processes. Temporal representations can be linear (sequential) or hierarchical (nested), and can support planning, scheduling, and causal reasoning. Examples of temporal representations include event schemas, scripts, and temporal logic

Cognitive Processes Involved

⊙ **Encoding** is the process of converting sensory information into mental representations that can be stored in memory. It involves attention, perception, and interpretation, and can be influenced by prior knowledge, expectations, and

goals

- **Storage** refers to the maintenance of encoded information in memory over time. It can be short-term (working memory) or long-term (episodic, semantic, procedural memory), and involves different neural mechanisms and capacities. Storage can be affected by factors such as rehearsal, organization, and interference from other information
  - **Retrieval** is the process of accessing and using stored information from memory. It can be cued by external stimuli (recognition) or internally generated (recall), and can be facilitated by contextual and associative cues. Retrieval can be affected by factors such as the strength of encoding, the passage of time, and the similarity and distinctiveness of stored information
- **Inference** is the process of deriving new knowledge from existing representations and rules. It can be deductive (drawing necessary conclusions from premises), inductive (generalizing from specific instances), or abductive (generating explanatory hypotheses). Inference can be used to fill in missing information, make predictions, and solve problems based on available knowledge
- **Reasoning** is the process of manipulating and transforming knowledge representations to draw conclusions, make decisions, and solve problems. It can be logical (based on formal rules and principles), analogical (based on similarities and mappings between domains), or heuristic (based on simplified rules and strategies). Reasoning can be influenced by factors such as the complexity of the problem, the availability of relevant knowledge, and the cognitive biases and limitations of the reasoner.

COURSE SUMMARY
Course 10: The Organization of Knowledge in the Mind

This course examines how knowledge is structured mentally. Concepts and categories are studied through **prototype theory** (best examples of categories) and **exemplar theory** (specific instances). **Semantic networks** are introduced as models of how concepts are linked.

Schemas and scripts are emphasized as frameworks that guide perception, memory, and behavior. For example, a “restaurant script” helps us predict events when dining out. Cognitive maps and mental models are also explored, showing how people represent spatial and abstract knowledge.

Applications include education (how knowledge organization affects learning), artificial intelligence (knowledge representation), and everyday reasoning. Students learn that the way knowledge is organized influences how easily it can be recalled and applied.

TEST YOUR UNDERSTANDINGF
Course 10: Organization of Knowledge in the Mind

1. A prototype is:
    - A) A mental framework
    - B) The best example of a category
    - C) A specific memory
    - D) A schema
2. Semantic networks represent:
    - A) Emotional states
    - B) Links between concepts
    - C) Reflexes
    - D) Sensory input
3. Scripts are:
    - A) Step-by-step procedures
    - B) Event sequences stored in memory
    - C) Emotional responses
    - D) Reflex actions
4. Cognitive maps represent:
    - A) Emotional states
    - B) Spatial knowledge
    - C) Reflexes
    - D) Language rules
5. Knowledge organization influences:
    - A) Recall and learning
    - B) Reflexes
    - C) Emotions only
    - D) Sensation

Supplemental Resources

Readings

Read these two articles for more details about Knowledge Representation in the Mind:

- Knowledge Representation in the Brainavailable at: https://socialsci.libretexts.org/Under_Construction/Purgatory/PSYC_316%3A_Cognition_(Carbary)/07%3A_Concepts_and_Knowledge/7.02%3A_Knowledge_Representation_in_the_Brain

- Knowledge Representation, At https://psycnet.apa.org/record/2002-01035-005

Videos

Watch these videos to conceive a clear idea about **Knowledge Representation** :

- **Lecture 5.2 Knowledge Representation**

  https://www.youtube.com/watch?v=1EoWEDgPQPQ

- **Mental Representation- Cognitive Psychology- Core concepts**

https://www.youtube.com/watch?v=G7FfM0iVhF0

*Assignment: Check your progress

Reflect on your online and classroom discussions and readings and summarize your response in one to two paragraphs

1. Group discussion

Here are some questions to answer as an extension of the course content (To be discussed in groups):

1. How is knowledge represented in the mind?
2. What are mental representations of knowledge?
3. What is the representation theory of the mind?
4. What are the knowledge representations in humans?

Further Resources

- Anderson, J. R. (1983). The architecture of cognition. Cambridge, MA: Harvard University Press.
- Brachman, R. J., & Levesque, H. L. (Eds.). (1985). Readings in knowledge representation. Los Altos: Kaufmann.
- Bruner, J. S. (1964). The course of cognitive growth. The American Psychologist, 19, 1–16.

- Davis, R., Shrobe, H., &Szolovits, P. (1993). What is a knowledge representation? Artificial Intelligence Magazine, 14(1), 17–33.
- Markman, A. B. (1998). Knowledge representation. Mahwah: Erlbaum.
- Pylyshyn, Z. (1984). Computation and cognition: Toward a foundation for cognitive science. Cambridge, MA: MIT Press.

✦ Pirnay-Dummer, P., Ifenthaler, D., Seel, N.M. (2012). Knowledge Representation. In: Seel, N.M. (eds) Encyclopedia of the Sciences of Learning. Springer, Boston, MA. https://doi.org/10.1007/978-1-4419-1428-6_875

Course 11:Language Processing

- **Course Scope**: An extension to the general domain of cognitive psychology (This course is an introduction to knowledge representation in the brain)

- **Course LearningObjectives**

  At the conclusion of this course, you should be able to:

- . Grasp theoretical concepts related to how knowledge is represented in the human mind and brain.
- Analyze different views on how mental representations are stored, retrieved, and their nature and existence.
- Evaluate the connections between real-world findings and how those findings are understood in relation to knowledge representation and dynamic processing.

Guiding Thoughts to the Course

1. What is the meaning of language processing?
2. What is language processing in humans?
3. What are the examples of language processing?

- **CourseContent**

Language processing is a complex mental skill that enables us to understand and produce language. It involves several steps, from hearing speech to grasping its meaning, requiring a blend of language knowledge and context. Research in this area examines undetanding, speaking, and language learning, using techniques like experiments and brain scans to explore how our brains manage language and how multilingualism affects cognitive skills.

- **What is language?**

Language can be defined as a system of conventional spoken, manual (signed), or written symbols by means of which human beings, as members of a social group and participants in its culture, express themselves. The functions of language include communication, the expression of identity, play, imaginative expression, and emotional release. Key Concepts in Language Processing[30]

[30] https://www.britannica.com/topic/language

What is language processing?

In psycholinguistics, **language processing** refers to the way humans use words to communicate ideas and feelings, and how such communications are processed and understood. Language processing is considered to be a uniquely human ability that is not produced with the same grammatical understanding or systematicity in even human's closest primate relatives.[31]

Language Processing Mechanism

Language processing involves the cognitive mechanisms and processes that enable humans to understand and produce language

- Language skills include both understanding (listening and reading) and expressing (speaking and writing).
- It involves different processing levels like sounds (phonology), word forms (morphology), sentence structure (syntax), meanings (semantics), and how language is used in context (pragmatics).
- To understand language, one must combine language knowledge with real-world knowledge and context.
- Language processing is a complex activity that requires different mental systems to work together, including attention, memory, and perception.
- People have different language processing skills, which can be affected by age, education, language background, and cognitive skills.
- Researchers can study language processing through methods like behavioural tests, brain imaging (fMRI, EEG), and computer models.

Language Processing in the Brain

The language evolution model suggests that processing goes from "where" to "what." Once these sounds reach the frontal cortex, they can activate reactions or specific emotions based on a person's life experiences. Additionally, the occipital cortex, which

[31] McDonald, Sevcik, Hopkins, and Rupert (1986)". *Journal of Experimental Psychology: General*. 116 (3): 279–287. doi:10.1037/0096-3445.116.3.279. S2CID 18329599.

handles vision, has connections to the frontal cortex that play a role in language processing, particularly inreading.

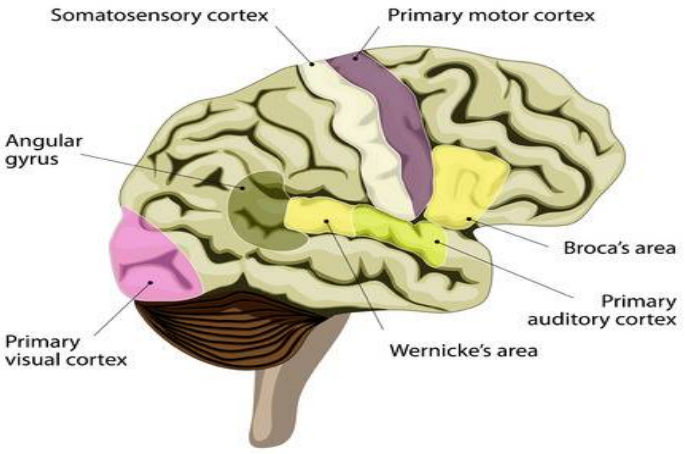

Fig 6: Language Processing in the Brain

A distributed network of brain regions, primarily in the left hemisphere, supports language processing:

- ***Broca's area*** in the left frontal lobe is associated with speech production and syntactic processing
- ***Wernicke's area*** in the left temporal lobe is involved in language comprehension and semantic processing
- ***The arcuate fasciculus*** is a white matter tract that connects Broca's area and Wernicke's area, enabling the integration of language production and comprehension
- ***The angular gyrus*** in the parietal lobe is involved in the integration of linguistic and non-linguistic information (gestures, visual information)

The right hemisphere also plays a role in language processing, particularly in the processing of prosody (intonation, stress) and figurative language (metaphors, idiom. Damage to specific brain regions can result in language disorders such as aphasia (impairment in language production or comprehension) and dyslexia (difficulty with reading).

- **Stages of Language Comprehension**

Language comprehension involves numerous stages of processing that occur rapidly and in parallel:

- **Speech Perception**, which involves the processing of acoustic signals into phonetic and phonological representations
- **Lexical Access** is the next stage, where the listener retrieves the meaning of individual words from their mental lexicon
- **Syntactic parsing** involves the analysis of the grammatical structure of the sentence to determine the relationships between words and phrases
- **Semantic integration** is the process of combining the meanings of individual words and phrases to construct a coherent representation of the overall meaning of the sentence or discourse
- **Pragmatic interpretation** involves the use of contextual information and world knowledge to infer the speaker's intended meaning beyond the literal meaning of the words
- **Comprehension monitoring** is the process of actively monitoring one's own understanding and making adjustments as needed (asking for clarification, rereading)

The stages of language comprehension are highly interactive and can influence each other (top-down and bottom-up processing)

- **Language Production Models**

Language production involves the process of translating thoughts and ideas into spoken or written language.

- **Levelt's model**[32] of language production proposes three main stages: conceptualization, formulation, and articulation:

[32]Levelt, W. (1995), "The Ability to Speak: From Intentions to Spoken Words", *European Review*, 3(1), pp.13-23.

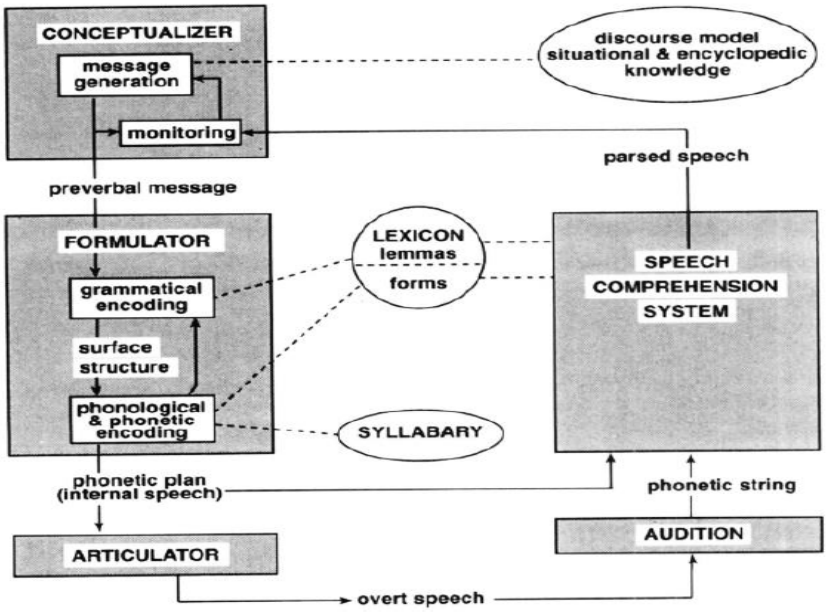

Fig 7: Levelt's model of language production (Levelt, 1995, p.14).

- ***Conceptualization*** involves the planning and selection of the message to be conveyed
- ***Formulation*** involves the selection of appropriate words (lexicalization) and the construction of the grammatical structure of the sentence (syntactic encoding)
- **Articulation** involves the motor planning and execution of speech sounds.

- **Dell's spreading activation model** emphasizes the role of spreading activation between linguistic units (words, phonemes) in the lexical network during language production
- **The interactive activation model** proposes that language production involves the interaction of multiple levels of processing (semantic, syntactic, phonological) in a parallel and interactive manner

Language production is influenced by various factors:

- ✓ The Speaker'sgoals,
- ✓ The communicative context,
- ✓ the listener's knowledge and expectations
- ✓ Speech errors (slips of the tongue) can provide insights into the underlying processes and representations involved in language production

Language Disorders and Impairments

Language disorders refer to difficulties in the acquisition, comprehension, or production of language that cannot be explained by sensory, motor, or intellectual impairments

- ***Specific Language Impairment (SLI)*** is a developmental disorder characterized by difficulties with language acquisition in the absence of other cognitive or sensory impairments
- ***Dyslexia*** is a learning disorder characterized by difficulties with accurate and fluent word recognition and poor spelling and decoding abilities
- ***Aphasia*** is an acquired language disorder resulting from brain damage (stroke, traumatic brain injury) that affects language production, comprehension, or both
    - ***Broca's aphasia*** is characterized by non-fluent, effortful speech production with relatively preserved comprehension
    - ***Wernicke's aphasia*** is characterized by fluent but meaningless speech production and poor comprehension
- ***Stuttering*** is a fluency disorder characterized by disruptions in the flow of speech (repetitions, prolongations, blocks)

Language disorders can have significant impacts on academic, social, and occupational functioning. Intervention approaches for language disorders often involve speech-language therapy, educational accommodations, and assistive technologies.

COURSE SUMMARY
Course 11: Language Processing

Language is the system of communication that allows humans to convey meaning. This course covers **language acquisition**, explaining how children learn phonology, syntax, and semantics. Theories such as Chomsky's nativist approach and Skinner's behaviorist view are compared.

Students study **psycholinguistics**, focusing on comprehension, production, grammar, and meaning. The relationship between language and thought is examined through the **Sapir-Whorf hypothesis**, which suggests that language shapes perception.

Practical examples include bilingualism, language disorders (aphasia), and the role of context in understanding meaning. Applications extend to education, communication, and cross-cultural psychology. By the end, learners appreciate language as both a cognitive process and a cultural tool.

TEST YOUR UNDERSTANDING
Course 11: Language

1. Psycholinguistics studies:
    - A) Reflexes
    - B) Language comprehension and production
    - C) Emotional regulation
    - D) Sensory input
2. Chomsky argued that language is:
    - A) Learned through conditioning
    - B) Innate
    - C) Random
    - D) Cultural only
3. The Sapir-Whorf hypothesis suggests:
    - A) Language shapes thought
    - B) Thought shapes language
    - C) Language is universal
    - D) Language is unrelated to cognition
4. Aphasia is:
    - A) Memory disorder
    - B) Language disorder
    - C) Attention deficit
    - D) Emotional disturbance
5. Bilingualism shows:
    - A) Language limits cognition
    - B) Language flexibility
    - C) Language is fixed
    - D) Language is innate only.

Readings

Read these two articles for more details about language processing in the brain :

- Speech & Language available at:
- https://memory.ucsf.edu/symptoms/speech-language#:~:text=Anatomy%20of%20Language&text=Wernicke's%20area%20is%20a%20critical,it%20is%20written%20or%20spoken.
- Language processing in the brain, At https://en.wikipedia.org/wiki/Language_processing_in_the_brain

Videos

Watch these videos to conceive a clear idea about language processing :

- **language processing**

https://www.youtube.com/watch?v=bZZYxW6yGSU

The Brain and Language

https://www.youtube.com/watch?v=zj0yud4wv74

Assignment: Check your progress

Reflect on your online and classroom discussions and readings and summarize your response in one to two paragraphs

2. Group discussion

Here are some questions to answer as an extension of the course content (To be discussed in groups):

1. How does the brain process and control language?
2. What part of the brain controls language-learning?
3. Is language processing left or right brain?
4. How is language represented in the brain?

Supplemental Resources

1. **How our brain processes language over time**

   https://www.mpg.de/21117594/how-our-brain-processes-language-over-time

2. Processing Language via Brain
https://www.mpg.de/21117594/how-our-brain-processes-language-over-time

3. **3.** The Foundations of Language Processing
https://www.brainfacts.org/thinking-sensing-and-behaving/language/2012/language-processing

Course 12: Problem Solving and Creativity

h) **Course Scope**: An extension to the general domain of cognitive psychology (This course is an introduction to problem solving andCreativity)

- **Course LearningObjectives**

At the conclusion of this course, you should be able to:

- Distinguish between well-defined and ill-defined problems.
- Identify the importance of insight problems in understanding how humans solve problems.

Guiding Thoughts to the Course
1. What is meant by problem solving?
2. Why is it important?
3.What are the steps to problem-solving?
4. What are the problem-solving skills?

- **CourseContent**

Problem solving is a fundamental aspect of cognitive psychology. It includes the mental processes that people use to discover, analyze, and solve problems. This process is essential to human intelligence and ability to navigate the world around them.

What is Problem Solving?

- In psychology, problem solving refers to the process of finding solutions to problems encountered in life[33].
- In cognitive psychology, the term 'problem-solving' refers to the mental process that people go through to discover, analyze, and solve problems.[34]

- **What** is **a problem?**

The most basic definition of a problem is any given situation that differs from a

[33]Granvold, Donald K. (1997). "Cognitive-Behavioural Therapy with Adults". In Brandell, Jerrold R. (ed.). Theory and Practice in Clinical Social Work. Simon and Schuster. pp. 189. ISBN 978-0-684-82765-0.
[34]Sarathy V. Real world problem-solving. Front Hum Neurosci. 2018;12:261. doi:10.3389/fnhum.2018.00261

desired goal[35].

Types of Problems

Problems themselves can be classified into two different categories known as ill-defined and well-defined problems (Schacter, 2009)[36].

Well-defined problems have a clear goal and a clear solution path. These problems are typically easier to solve because the individual knows exactly what they need to do to reach the solution. Examples of well-defined problems include mathematical equations and puzzles.

- **Ill-defined problems** do not have a clear goal or solution path. These problems are more complex and require more cognitive effort to solve. Examples of ill-defined problems include ethical dilemmas and complex real-world problems like climate change or political conflicts.

Problem-Solving Process

Some strategies that you might use to figure out the source of a problem include:

1. **Problem identification:** Is there actually a problem?
2. **Problem definition and representation:** What exactly is this problem?
   - Ask questions about the issue
   - Divide the problem into smaller parts
   - View the problem from various angles
   - Research to understand how different factors are connecte
3. **Strategy formulation:** How can the problem be solved?

After the problem has been identified, brainstorm potential solutions by generating as many ideas as possible without judging their quality.

4. **Organization of information:** How do the various pieces of information in the problem fit together?
5. **Resource allocation:** How much time, effort, money should be put into this problem?

[35]https://pressbooks.pub/cognition/chapter/problem-solving-from-an-evolutionary-perspective/
[36] Schacter, D. L. (1999). The seven sins of memory: Insights from psychology and cognitive neuroscience. *American Psychologist*, 54(3), 182.

6. Monitoring Progress: Effective problem-solvers tend to monitor their progress as they work towards a solution. If they are not making good progress toward reaching their goal, they will reevaluate their approach or look for new strategies.

7. Evaluating the Results: After a solution has been reached, it is important to evaluate the results to determine if it is the best possible solution to the problem.

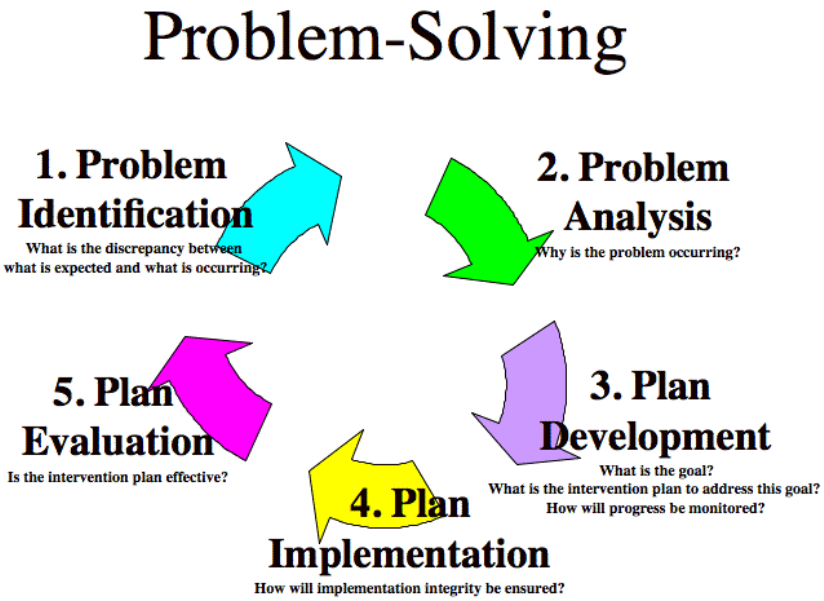

Fig8: Problem-Solving Process[37]

Problem-Solving Mental Processes

Several mental processes are at work during problem solving. Among them are[38]:

a) Perceptually recognizing the problem

b) Representing the problem in memory

c) Considering relevant information that applies to the problem

d) Identifying different aspects of the problem

e) Labelling and describing the problem

Problem-Solving Strategies

Problem solving usually involves practical thinking (logical reasoning) and understanding meanings (semantics). It often needs abstract thinking and creativity to come up with new solutions.There are various methods to solve a problem. You can use some of

[37] https://www.pinterest.com/pin/511651207637586759/
[38] https://www.verywellmind.com/problem-solving-2795008

these methods alone, or you might choose to combine several approaches to understand and resolve the issue.

A problem-solving strategy is a plan of action used to find a solution. Different strategies have different action plans associated with them:

Method	Description
Trial and error	Continue trying different solutions until problem is solved
Algorithm	Step-by-step problem-solving formula
Heuristic	General problem-solving framework

Table 3: Problem-Solving Strategies

I. **Trial and Error:** Using a trial-and-error method for solving problems means testing different solutions to see which one works. Although trial and error is not typically one of the most time-efficient strategies, it is a commonly used one.

II. **Heuristics** are mental shortcuts that are often based on solutions that have worked in the past. They can work well if the problem is similar to something you have encountered before and are often the best choice if you need a fast solution.

III. **Algorithms** are step-by-step strategies that are guaranteed to produce a correct result. While this approach is great for accuracy, it can also consume time and resources.

Obstacles to Problem-Solving

Problem-solving can be challenging due to various obstacles that hinder our ability to find solutions quickly and effectively. These obstacles include: :

- **Assumptions**: Making assumptions about limitations can restrict the exploration of potential solutions.
- **Functional Fixedness :** This habit leads individuals to view problems only in familiar ways, limiting the recognition of alternative solutions.
- **Irrelevant Information:** Identifying relevant information is crucial; irrelevant data can result in incorrect conclusions, especially in complex situations.
- **Mental Set**: Relying on past solutions can create rigidity, making it difficult to consider new ideas and find effective solutions.

Creativity

Studying creativity can be challenging. Creativity is a complex subject, and there is not a single way to define it. Most definitions agree that creativity involves solving problems or making new things in unique ways.

Creativity: What Is It?

- **Creativity** is the ability to produce or develop original work, theories, techniques, or thoughts. A creative individual typically displays originality, imagination, and expressiveness.
- **Creative thinking** refers to the mental processes leading to a new invention or solution to a problem. Products of creative thinking include new machines, social ideas, scientific theories, artistic works, and Products of creative thinking include new machines, social ideas, scientific theories, artistic works, and more. [39]

Two key parts of creativity are:

1. ***Originality***: The idea must be new and not just a variation of something that already exists.
2. ***Functionality***: The idea should be practical or have some usefulness.

Types of Creativity

Experts identify different kinds of creativity. The "four c" model outlines four types:

1. **"Mini-c" creativity** refers to personal ideas and insights that are unique to an individual.
2. **"Little-c" creativity** is about everyday problem-solving and thinking, helping people tackle common challenges and adapt to new situations.
3. **"Pro-C" creativity** occurs among skilled professionals who are creative in their jobs but do not gain widespread recognition for their work.
4. **"Big-C" creativity** involves significant contributions that are celebrated in a specific field, leading to notable achievements like medical breakthroughs, technological innovations, and artistic masterpieces.

[39] https://dictionary.apa.org/creativity

What Does It Take to Be Creative?

In his book ***Creativity: Flow and the Psychology of Discovery and Invention***, psychologist Mihaly Csikszentmihalyi [40] suggests that creative people tend to possess a variety of traits that contribute to their innovative thinking. Some of these key traits include:

- **Energy:** Creative people tend to possess a great deal of both physical and mental energy. However, they also tend to spend a great deal of time quietly thinking and reflecting.
- **Intelligence:** Psychologists have long believed that intelligence plays a critical role in creativity.
- **Discipline:** Creative people do not just sit around waiting for inspiration to strike. They are playful, yet they are also disciplined in the pursuit of their work and passions.

How to Boost Creativity

you can enhance your own abilities with these strategies:

1. Stay Open to New Ideas: Embrace new experiences and explore different concepts to foster creativity.

2. Be Determined: Creativity requires effort. Regular practice, even if not every attempt succeeds, helps develop your skills.

3. Set Aside Time for Creativity: Dedicate specific time each day or week for brainstorming, practicing, or creating.

[40] Csikszentmihalyi M (2013). Creativity: Flow and the Psychology of Discovery and Invention. New York: Harper Collins;.

COURSE SUMMARY
Course 12: Problem Solving and Creativity

Problem solving is the process of finding solutions to challenges. This course introduces strategies such as **algorithms** (step-by-step procedures) and **heuristics** (mental shortcuts). Barriers to problem solving, including fixation and functional fixedness, are discussed.

Creativity is studied as the ability to generate novel and useful ideas. Students explore **divergent thinking**, insight, and innovation. The course highlights factors that enhance creativity, such as open-mindedness, collaboration, and supportive environments.

Applications include scientific discovery, artistic expression, and everyday problem-solving. Learners understand that creativity is not limited to art but is essential in all domains of life.

TEST YOUR UNDERSTANDING
Course 12: Problem Solving and Creativity

1. Algorithms are:
    - A) Mental shortcuts
    - B) Step-by-step procedures
    - C) Emotional responses
    - D) Reflexes
2. Heuristics are:
    - A) Exact solutions
    - B) Mental shortcuts
    - C) Errors in reasoning
    - D) Reflexes
3. Functional fixedness is:
    - A) Seeing objects only in usual use
    - B) Creative thinking
    - C) Logical reasoning
    - D) Memory distortion
4. Divergent thinking involves:
    - A) Generating multiple solutions
    - B) Following one path
    - C) Using algorithms only
    - D) Eliminating creativity
5. Insight is:
    - A) Gradual problem solving
    - B) Sudden realization of solution
    - C) Trial-and-error
    - D) Memory recall

Readings

- Read these two articles for more details about creativity and problem solving in psychology:
- What Is Creative Problem-Solving & Why Is It Important?

https://online.hbs.edu/blog/post/what-is-creative-problem-solving#:~:text=Creative%20problem%2Dsolving%20uses%20two,turns%20ideas%20into%20concrete%20solutions.

- Creativity and Problem Solving, At https://naarm.org.in/focarsrepository/files/9.%20Creativity%20and%20Problem%20Solving.pdf

Videos

Watch these videos to conceive a clear idea about **Knowledge Representation** :

- **Problem Solving & Creativity**https://www.youtube.com/watch?v=8QITkDqJMrM
- **Creativity and Problem Solving with Professor Ian Turner** https://www.youtube.com/watch?v=4PlAL93ykWA

Assignment: Check your progress

Reflect on your online and classroom discussions and readings and summarize your response in one to two paragraphs

Group discussion

Here are some questions to answer as an extension of the course content (To be discussed in groups):

1) What is creative problem solving in psychology?
2) How are creativity and problem solving related?
3) What is the concept of creativity in psychology?
4) What defines creative thinking and problem-solving?

Supplemental Resources

- Creativity and Problem-Solving – Cognitive Psychology https://nmoer.pressbooks.pub/cognitivepsychology/chapter/creativity-and-problem-solving/
- Creativity and ProblemSolving https://naarm.org.in/focarsrepository/files/9. Creativity and Problem Solving.pdf
- Creative problem-solving https://en.wikipedia.org/wiki/Creative_problem-solving

Course 13:Reasoning and Decision Making

i) **Course Scope**: An extension to the general domain of cognitive psychology (This course is an introduction to problem solving andCreativity)

- **Course LearningObjectives**

At the conclusion of this course, you should be able to:

- Understand deductive and inductive reasoning
- Understand the main theories of decision making, as well as examples of how people's choice contexts affect the decisions they make

Guiding Thoughts to the Course
1. What is meant by reasoning?
2. Why is it important?
3.What are the steps to decision making?
4. What is the role of reasoning in decision-making?

- **CourseContent**

In the field of psychology, reasoning is a fundamental cognitive process that allows us to make decisions, solve problems, and understand the world around us.

- **Introduction to Thinking**

In psychology, thinking is defined as the cognitive process of manipulating information to create meaning, solve problems, make decisions, and generate new ideas[41]. Cognitive abilities like thinking, reasoning and problem-solving may be considered to be some of the chief characteristics which distinguish human beings from other species including the higher animals.

The APA Dictionary of Psychology defines thinking as ***"cognitive behaviour in which ideas, images, mental representations and other such hypothetical elements of thought are experienced or manipulated."***(APA Dictionary of Psychology", n.d.)[42].

[41] https://psychologydictionary.org/thinking/
[42] American Psychological Association. (n.d.). APA Dictionary of Psychology. American Psychological Association. https://dictionary.apa.org

Ways of Thinking

Thinking encompasses the following techniques:

Analysis – breaking down a large complex problem into smaller simpler problems

Synthesis – combining two or more concepts into a complex form

Divergentthinking – generating many ideas or possible solutions to a problem

Convergentthinking – choosing the best solution or idea of a possible many*

Categories of thinking processes

There are various categories of the thinking process that enclose**:**

- **Problem solving** – developing a solution to a problem situation
- **Judgments and decisionmaking** – involves making choices
- **Reasoning** – drawing conclusions given specific information
- **Creativity** – production of original thoughts and ideas

What is reasoning?

- Thinking in which logical processes of an inductive or deductive character are used to draw conclusions from facts or premises[43].
- Sherman defined, **"reasoning is a process of thinking during which the individual is aware of a problem identifies, evaluates, and decides upon a solution"[44].**
- Reasoning refers to the mental process by which we make sense of information or draw conclusions based on evidence or logic. It involves analyzing facts, evaluating options, weighing pros and cons before making decisions or solving problems[45].

Types of reasoning

There are wide-ranging types of reasoning:

1. **Deductive reasoning** is a method of proving a theory or hypothesis using formal logic and observations. Deductive reasoning starts with a hypothesis that is then supported or disproved through observations or rational thought.

[43] https://dictionary.apa.org/reasoning
[44] https://www.psychologydiscussion.net/thinking/reasoning-meaning-definition-and-types/2060
[45] https://library.fiveable.me/key-terms/ap-psych/reasoning

2. **Inductive reasoning** employs theories and assumptions. It is the polar opposite of deductive reasoning in that it requires deducing a general rule from a specific case or cases.

3. **Analogical reasoning** is a style of reasoning that looks for similarities between two or more objects and then uses those similarities to find other properties they share. It is based on the brain's tendency to notice patterns and make connections.

4. **Abductive reasoning** is a style of reasoning that reaches a logical conclusion based on an observation or group of observations. Abductive reasoning is similar to inductive reasoning, but it allows making the greatest estimates to get the simplest conclusions.

5. **Cause-and-effect reasoning** is a style of reasoning in which the relationship between two events is demonstrated. This logic is used to describe what might happen if a certain action is taken or why certain things happen when certain circumstances are met.

6. **Critical thinking** entails delving deeply into a topic's rationale in order to reach a definitive conclusion. Computing, engineering, social sciences, and logic all benefit from it. When it comes to problem-solving, critical thinking is especially important when dealing with technological challenges.

7. **Decompositional reasoning** is the process of breaking things down into their basic components in order to comprehend how each component contributes to the overall functionality of the object.

Decision-making

What is decision making?

In psychology, decision-making is regarded as the cognitive process resulting in the selection of a belief or a course of action among several possible alternative options. It could be either rational or irrational. The decision-making process is a reasoning process based on assumptions of values, preferences and beliefs of the decision-maker.Every decision-making process produces a final choice, which may or may not prompt action[46].

[46] https://en.wikipedia.org/wiki/Decision-making

Decision-making process

The decision making process is the method of gathering information, assessing alternatives, and, ultimately, making a final choice.

1. ***Define the Decision$:*** Clarify the problem to gather relevant information for the best solution.
2. ***Collect Information:*** Gather data related to the decision to make an informed choice.
3. ***Explore Alternatives:*** Identify various solutions.
4. ***Evaluate Options:*** Assess the pros and cons of each alternative to narrow down choices.
5. ***Make a Choice:*** Decide on the best option based on gathered information and its potential impact.
6. ***Take action:***Once the final decision is taken, it is time to put the solution into action.

7. Review your decision and its impact (both good and bad): Once you have made a decision, you can monitor the success metrics you outlined in step

Types of decision making models

There are three main decision-making models designed to help analyze relevant information and make optimal decisions:

1. Rational decision-making models: This is the most widely used type of decision-making model. It follows a logical and step-by-step approach. The seven steps mentioned earlier illustrate this model.

2. Intuitive decision-making models: This model relies on instincts rather than data or information. It depends on experiences and recognizing patterns to develop strong gut feelings.

3. Creative decision-making model: This model focuses on gathering information and insights about an issue and generating possible solutions, much like the rational decision-making m

Reasoning as a Foundation for Decision-Making

Reasoning and decision-making are closely interconnected cognitive processes that work together to guide human actions and choices.

- Reasoning involves analysing information, identifying patterns, and drawing

conclusions. It is the process of logically evaluating options based on available evidence or principles.

- Decision-making, on the other hand, is the process of selecting a course of action among alternatives, often influenced by the reasoning process.

For example, when choosing a university program, reasoning helps you weigh the pros and cons of different options (e.g., costs, career opportunities) before making the final decision.

COURSE SUMMARY

Course 12: Decision Making and Reasoning

Decision making involves choosing among alternatives, often under uncertainty. This course distinguishes between **rational decision-making** and **heuristic-based reasoning**. Common biases are studied, including confirmation bias, availability heuristic, and anchoring.

Reasoning is explored through **deductive logic** (drawing conclusions from general principles) and **inductive reasoning** (inferring general rules from specific cases). Dual-process models are introduced, distinguishing between fast, intuitive thinking and slow, analytical reasoning.

Applications include everyday choices, professional decision-making, and risk assessment. Students learn how biases affect judgment and how critical thinking can improve reasoning. By the end, learners appreciate decision making as a balance between intuition and logic.

TEST YOUR UNDERSTANDINGF

Course 12: Decision Making and Reasoning

1. Rational decision-making relies on:
    - A) Heuristics
    - B) Logical analysis
    - C) Emotional bias
    - D) Intuition only
2. Availability heuristic means:
    - A) Using easily recalled examples
    - B) Using logical rules
    - C) Ignoring memory
    - D) Using unconscious drives
3. Anchoring bias occurs when:
    - A) Initial info influences decisions
    - B) Memory fails
    - C) Language shapes thought
    - D) Emotions dominate
4. Deductive reasoning moves from:
    - A) Specific to general
    - B) General to specific
    - C) Random to logical
    - D) Intuitive to rational
5. Dual-process models distinguish between:
    - A) Reflex and voluntary actions
    - B) Fast intuitive vs. slow analytical thinking
    - C) Memory and perception
    - D) Language and thought

Readings

- Read these two articles for more details about reasoning and decision making in psychology:
- Cognitive Psychology and Cognitive Neuroscience/Reasoning and Decision Making? https://pressbooks.pub/cognition/chapter/reasoning-and-decision-making/
- Logical Reasoning and Decision Making, At https://www.researchgate.net/publication/238594486_Logical_reasoning_and_decision_making

Videos

Watch these videos to conceive a clear idea aboutreasoning and decision making:

- **Critical Thinking Skills: A Process for Better Problem Solving and Decision Making** https://www.bing.com/videos/riverview/relatedvideo?q=Reasoning+and+Decision+Making+basics&&view=riverview&mmscn=mtsc&mid=8F1F36091590D1D293F38F1F36091590D1D293F3&&aps=474&FORM=VMSOVR
- **Logical reasoning questions to trick your brain**https://www.bing.com/videos/riverview/relatedvideo?&q=Reasoning+and+Decision+Making+basics&&mid=6DBA81CB004A36F482846DBA81CB004A36F48284&&FORM=VRDGAR https://www.youtube.com/watch?v=4PlAL93ykWA

Assignment: Check your progress

Reflect on your online and classroom discussions and readings and summarize your response in one to two paragraphs

Group discussion

Here are some questions to answer as an extension of the course content (To be discussed in groups):

1. What is decision-making in reasoning?
2. What does reasoning mean in psychology?
3. What are the two levels of reasoning and decision-making?
4. What is the psychology of decision-making?

Supplemental Resources

1. Reasoning and Decision Making

C:\Users\MSTR\Desktop\Reasoning and Decision Makinghttps:\is.muni.cz › GOLDSTEIN_Thinking

2. Reasoning · Deductive reasoning · Inductive reasoning · Decision making

https://pressbooks.pub/cognition/chapter/reasoning-and-decision-making/#Reasoninghttps://pubmed.ncbi.nlm.nih.gov/8287673/

3. The interaction between reasoning and decision making

   https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://www.researchgate.net/publication/14910965_The_interaction_between_reasoning_and_decision_making_an_introduction&ved=2ahUKEwiwqr2qgpaLAxWQxQIHHRNFERoQFnoECC0QAQ&usg=AOvVaw26Lx2M56Q5y_ulE3LVk_rR

4. The interaction between reasoning and decision making

   https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://www.researchgate.net/publication/14910965_The_interaction_between_reasoning_and_decision_making_an_introduction&ved=2ahUKEwiwqr2qgpaLAxWQxQIHHRNFERoQFnoECC0QAQ&usg=AOvVaw26Lx2M56Q5y_ulE3LVk_rR

Course takeaways

Course 1: An Overview of General Psychology- Takeaway

- **General Psychology is often an introductory course designed to provide an understanding of the basic principles, concepts, and fields within psychology. Here's a brief summary:**

1. **Introduction to Psychology**: Covers the history, scope, and goals of psychology as a science.
2. **Research Methods**: Explores various methodologies psychologists use to study behaviour, including experiments, surveys, and case studies.
3. **Biological Basis of Behaviour**: Examines how the brain, nervous system, and hormones influence thoughts and actions.
4. **Cognition and Learning**: Focuses on memory, thinking, problem-solving, and how we learn.
5. **Developmental Psychology**: Studies human growth and change across the lifespan, from infancy to old age.
6. **Personality Theories**: Discusses major theories of personality, such as those proposed by Freud, Jung, and others.
7. **Social Psychology**: Looks at how individuals interact with others and are influenced by social environments.
8. **Mental Health**: Covers psychological disorders, their symptoms, and approaches to treatment.
9. **Applied Psychology**: Explores the use of psychology in practical settings, like education, business, and healthcare.

- **Applying psychology in everyday life can have a huge impact on improving your relationships, productivity, decision-making, and overall well-being. Here are some practical ways to integrate psychology concepts into your daily routine:**

1. **Enhance Communication** (Social Psychology): Understanding nonverbal cues, active listening, and empathy can help you connect better with others. For example, maintaining eye contact and mirroring body language can build rapport.
2. **Boost Productivity** (Behavioural Psychology): Use principles like positive reinforcement to create habits. Reward yourself for completing tasks to stay motivated, and break larger goals into smaller, achievable steps.
3. **Improve Mental Health** (Cognitive Psychology): Practice mindfulness to manage stress or use cognitive restructuring techniques to challenge negative thoughts. Learning how your thoughts influence your emotions can be empowering.

4. **Strengthen Relationships** (Developmental and Personality Theories): Understanding different personality types and developmental stages can help you empathize and adapt to others' perspectives, whether it's in personal or professional settings.
5. **Make Better Decisions** (Cognitive Biases): Be aware of common biases, like confirmation bias or availability heuristic, to avoid flawed thinking. Take a step back, analyze the facts, and question assumptions.
6. **Parenting and Teaching** (Developmental Psychology): Tailor your approach based on the child's developmental stage. Recognize their learning style and emotional needs for better engagement.
7. **Understand Behaviour** (Biological Psychology): Recognizing how factors like sleep, nutrition, and hormones affect behaviour can help you make healthier lifestyle choices.
8. **Conflict Resolution** (Social Psychology): Apply techniques like identifying shared goals or de-escalation strategies to resolve disputes calmly and effectively.

Course 3: History of Cognitive psychology–– Key Moments Timeline

Cognitive psychology emerged in the mid-20th century as a response to the limitations of behaviourism, which focused only on observable behaviour. Influenced by advances in **computer science**, early cognitive psychologists like **Ulric Neisser** (who coined the term in 1967) began studying the mind as an **information processor**. The field drew on insights from **philosophy**, **linguistics** (like Noam Chomsky's critique of behaviourism), and **neuroscience**, marking a shift toward understanding **internal mental processes** like memory, perception, attention, and language. This movement became known as the **"cognitive revolution."**

1. Before 1900s – Philosophy Roots

- Thinkers like **Descartes**, **Locke**, and **Kant** pondered the nature of the mind and knowledge.
- These ideas laid the groundwork for psychology's future focus on mental processes.

2. Early 1900s – Rise of Behaviourism

- Psychologists like **John B. Watson** and **B.F. Skinner** focused on **observable behaviour**, dismissing the mind as a "black box."
- Mental processes were considered unscientific.

3. 1950s–1960s – The Cognitive Revolution

- Growing dissatisfaction with behaviourism's limits.
- **Noam Chomsky** challenged Skinner's views on language, showing that behaviourism couldn't explain complex mental functions.

- Inspired by computer science, the mind was seen as an **information processor** (input → process → output).

4. 1967 – Cognitive Psychology Officially Named

- **Ulric Neisser** published *Cognitive Psychology*, defining the field and sparking widespread interest.
- Focus turned to **perception, memory, attention, language, and problem-solving**.

5. 1970s–Present – Integration and Expansion

- Cognitive psychology merged with **neuroscience**, becoming **cognitive neuroscience**.
- Use of brain imaging (like fMRI) deepened our understanding of **how mental processes map to the brain**.
- The field now interacts with AI, education, therapy, and more.

Course4: Schools of Psychology: Main Schools of Though

OVERVIEW OF THE MAIN SCHOOLS OF THOUGHT IN PSYCHOLOGY:

1. **STRUCTURALISM***
   - Founded by **Wilhelm Wundt** and **Edward Titchener**.
   - Focus: Breaking down mental processes into basic components.
   - Method: Introspection.
2. **FUNCTIONALISM**
   - Influenced by **William James** and **Charles Darwin**.
   - Focus: How mental processes help individuals adapt to environments.
3. **PSYCHOANALYSIS**
   - Founded by **Sigmund Freud**.
   - Focus: The unconscious mind, childhood experiences, and inner conflicts.
   - Method: Dream analysis, free association.
4. **BEHAVIOURISM**
   - Key figures: **John B. Watson**, **B.F. Skinner**.
   - Focus: Observable behaviour and the effects of learning.
   - Method: Conditioning (classical and operant).
5. **HUMANISTIC PSYCHOLOGY**
   - Key figures: **Carl Rogers**, **Abraham Maslow**.
   - Focus: Free will, self-actualization, and personal growth.
   - Emphasizes positive humanpotential.
6. **COGNITIVE PSYCHOLOGY**

- Focus: Mental processes like thinking, memory, perception, and problem-solving.
- Sees the mind as an information processor.

7. **BIOLOGICAL PSYCHOLOGY**
   - Focus: The brain, neurotransmitters, genetics, and the body's impact on behaviour.
   - Uses tools like brain scans and studies on the nervous system.
8. **EVOLUTIONARY PSYCHOLOGY**
   - Focus: How evolution shapes behaviour and mental processes.
   - Inspired by Darwin's theory of natural selection.

Course 5: Cognitive Psychology Theories

OVERVIEW OF KEY COGNITIVE PSYCHOLOGY THEORIES:

1. **Information Processing Theory**

This theory compares the mind to a computer: it receives input (stimuli), processes it, stores it (memory), and produces output (behaviour). It emphasizes sequential stages like attention, encoding, storage, and retrieval.

2. **Schema Theory**

Proposes that our minds use "schemas"—mental frameworks—to understand and interpret information. Schemas help us make sense of new experiences based on what we already know.

3. **Dual-Process Theory**

Suggests we have two systems of thinking:

- System 1: fast, automatic, intuitive
- System 2: slow, deliberate, logical

It's used to explain decision-making and reasoning.

4. **Cognitive Load Theory**

Focuses on how much mental effort is being used in working memory. It's especially influential in educational psychology, where it's used to optimize instructional design.

5. **Working Memory Model (Baddeley & Hitch)**

Describes short-term memory as having multiple components:

- Central Executive (attention control)
- Phonological Loop (verbal info)
- Visuospatial Sketchpad (visual/spatial info)
- Episodic Buffer (integrates info)

UNIT II: COGNITIVE PROCESSES

Major Cognitive Processes

Cognitive psychology focuses on the **mental processes** that help us take in, store, process, and use information. The **major cognitive processes** include:

1. **Perception**
   - How we interpret sensory information from the environment (sight, sound, touch, etc.)
   - Example: Recognizing a face in a crowd.
2. **Attention**
   - The ability to focus on specific stimuli or tasks while ignoring others.
   - Example: Listening to one person in a noisy room.
3. **Memory**
   - The process of encoding, storing, and retrieving information.
   - Types include short-term, long-term, and working memory.
   - Example: Remembering a phone number or your first day at school.
4. **Language**
   - How we understand, produce, and use language to communicate.
   - Example: Reading a book or having a conversation.
5. **Thinking**
   - Includes reasoning, decision-making, and problem-solving.
   - Example: Planning a trip or solving a puzzle.
6. **Learning**
   - The process of acquiring new knowledge or skills through experience or instruction.
   - Example: Learning to play an instrument or understanding a new concept.

*

KEY ANSWERS

Semester 5:Unit One: Fundamentals of Cognitive Psychology

Course 1: An Overview of General Psychology

1. B) Scientific study of behaviour and mental processes
2. B) Developmental psychology
3. C) Naturalistic observation
4. B) Wundt
5. B) Biological

Course 2: Cognitive Psychology: Defining Key Concepts

1. B) Mental processes of acquiring and using knowledge
2. C) Breathing
3. B) Mental frameworks organizing knowledge
4. B) Computer science
5. B) Focus on relevant information

Course 3: History of Cognitive Psychology

1. B) Wundt
2. B) Behaviourism
3. B) 1950s–1960s
4. A) Neisser
5. A) Linguistics

Course 4: Schools of Psychology

1. B) Breaking down mental processes
2. A) Purpose of mental processes
3. B) Observable behaviour
4. B) Unconscious motives
5. B) Self-actualization

Course 5: Cognitive Psychology Theories

1. B) A computer
2. B) Mental frameworks organizing knowledge
3. A) Neural networks
4. B) Fast intuitive vs. slow analytical thinking
5. A) Schema theory

Semester 6: Unit Two — Cognitive Processes

Course 6: Perception

6. Perception is best defined as:
    - A) Detecting raw sensory input
    - B) Interpreting sensory information □
    - C) Reflexive motor response
    - D) Emotional reaction
7. Which principle explains why we see patterns as wholes rather than parts?
    - A) Behaviorism
    - B) Gestalt principles □
    - C) Schema theory
    - D) Psychoanalysis
8. Bottom-up processing relies on:
    - A) Prior knowledge
    - B) Data-driven input □
    - C) Expectations
    - D) Emotional states
9. Depth perception depends on:
    - A) Binocular cues □
    - B) Reflexes
    - C) Memory
    - D) Language
10. Optical illusions demonstrate:
    - A) Errors in sensation
    - B) Active construction of perception □
    - C) Memory distortion
    - D) Emotional bias

Course 7: Attention and Consciousness

6. Selective attention allows us to:
    - A) Process all stimuli equally
    - B) Focus on relevant stimuli □
    - C) Eliminate distractions completely
    - D) Store information permanently
7. Divided attention refers to:
    - A) Focusing on one task
    - B) Splitting focus across tasks □
    - C) Ignoring all stimuli
    - D) Conscious awareness
8. Broadbent's filter model explains:
    - A) How memory is stored
    - B) How irrelevant stimuli are filtered □
    - C) How language is acquired
    - D) How emotions are processed
9. REM sleep is associated with:

- A) Deep unconsciousness
- B) Dreaming □
- C) Memory loss
- D) Reflex activity

10. Consciousness is defined as:
    - A) Reflexive behavior
    - B) Awareness of self and environment □
    - C) Emotional regulation
    - D) Automatic processing

Course 8: Memory

6. Working memory is responsible for:
    - A) Long-term storage
    - B) Holding and manipulating information □
    - C) Sensory detection
    - D) Emotional regulation
7. Encoding refers to:
    - A) Storing information permanently
    - B) Transforming input into memory □
    - C) Forgetting information
    - D) Retrieving knowledge
8. Forgetting due to interference occurs when:
    - A) Information decays naturally
    - B) New info disrupts old info □
    - C) Retrieval cues are strong
    - D) Memory is rehearsed
9. Chunking improves memory by:
    - A) Expanding capacity □
    - B) Eliminating distractions
    - C) Reducing rehearsal
    - D) Increasing forgetting
10. False memories show that:
    - A) Memory is a perfect recording
    - B) Memory is reconstructive □
    - C) Memory is unlimited
    - D) Memory is unconscious

Course 9: Organization of Knowledge in the Mind

6. A prototype is:
    - A) A mental framework
    - B) The best example of a category □
    - C) A specific memory
    - D) A schema
7. Semantic networks represent:
    - A) Emotional states
    - B) Links between concepts □
    - C) Reflexes

- D) Sensory input

8. Scripts are:
   - A) Step-by-step procedures
   - B) Event sequences stored in memory □
   - C) Emotional responses
   - D) Reflex actions
9. Cognitive maps represent:
   - A) Emotional states
   - B) Spatial knowledge □
   - C) Reflexes
   - D) Language rules
10. Knowledge organization influences:
    - A) Recall and learning □
    - B) Reflexes
    - C) Emotions only
    - D) Sensation

Course 10: Language

6. Psycholinguistics studies:
   - A) Reflexes
   - B) Language comprehension and production □
   - C) Emotional regulation
   - D) Sensory input
7. Chomsky argued that language is:
   - A) Learned through conditioning
   - B) Innate □
   - C) Random
   - D) Cultural only
8. The Sapir-Whorf hypothesis suggests:
   - A) Language shapes thought □
   - B) Thought shapes language
   - C) Language is universal
   - D) Language is unrelated to cognition
9. Aphasia is:
   - A) Memory disorder
   - B) Language disorder □
   - C) Attention deficit
   - D) Emotional disturbance
10. Bilingualism shows:
    - A) Language limits cognition
    - B) Language flexibility □
    - C) Language is fixed
    - D) Language is innate only

Course 11: Problem Solving and Creativity

6. Algorithms are:
    - A) Mental shortcuts
    - B) Step-by-step procedures □
    - C) Emotional responses
    - D) Reflexes
7. Heuristics are:
    - A) Exact solutions
    - B) Mental shortcuts □
    - C) Errors in reasoning
    - D) Reflexes
8. Functional fixedness is:
    - A) Seeing objects only in usual use □
    - B) Creative thinking
    - C) Logical reasoning
    - D) Memory distortion
9. Divergent thinking involves:
    - A) Generating multiple solutions □
    - B) Following one path
    - C) Using algorithms only
    - D) Eliminating creativity
10. Insight is:
    - A) Gradual problem solving
    - B) Sudden realization of solution □
    - C) Trial-and-error
    - D) Memory recall

Course 12: Decision Making and Reasoning

6. Rational decision-making relies on:
    - A) Heuristics
    - B) Logical analysis □
    - C) Emotional bias
    - D) Intuition only
7. Availability heuristic means:
    - A) Using easily recalled examples □
    - B) Using logical rules
    - C) Ignoring memory
    - D) Using unconscious drives
8. Anchoring bias occurs when:
    - A) Initial info influences decisions □
    - B) Memory fails
    - C) Language shapes thought
    - D) Emotions dominate
9. Deductive reasoning moves from:
    - A) Specific to general
    - B) General to specific □
    - C) Random to logical

- D) Intuitive to rational

10. Dual-process models distinguish between:
    - A) Reflex and voluntary actions
    - B) Fast intuitive vs. slow analytical thinking □
    - C) Memory and perception
    - D) Language and thought

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Key Concepts and Terminologies[47]

Algorithm: A well-defined procedure or set of rules that is used to solve a problem or accomplish a task or that is used for conducting a series of computations. Often guarantees a solution but is less efficient than a heuristic.

Aphantasia: The condition of having little to no mental imagery.

Aphasia: An inability to comprehend or formulate language because of damage to specific brain regions.

Audience: design Speakers design their utterances for their audiences by taking into account knowledge and context.

Awareness:A conscious experience or the capability of having conscious experiences, which is distinct from self-awareness, the conscious understanding of one's own existence and individuality.

Bottom-up processing: Information processing in which incoming sensory data initiate the higher level processes involved in their recognition, interpretation, and categorization.

Category:A set of entities that are equivalent in some way. Usually the items are similar to one another.

Chunking: The process by which the mind divides large pieces of information into smaller (often meaningful) units that are easier to retain. A form of recoding.

Classical Conditioning: A behaviourist approach to learning in which a neutral stimulus (event) comes to elicit a response through its association with an unconditioned stimulus that naturally produces a behaviour.

Cognitive Process: Internal mental processes involved in gaining knowledge and comprehension, including thinking, knowing, remembering, judging, and problem-solving.

Cognitive Psychology: A branch of psychology that studies mental processes,

Cognitive Map: A mental picture or visual representation of one's physical environment.

Cognitive Psychology: The branch of psychology that explores the operation of mental processes related to perceiving, attending, thinking, language, and memory, mainly through inferences from behaviour.

Concept An idea that represents a class of objects or their properties.

Connectionism: An approach in cognitive science that models mental or behavioural phenomena as the emergent processes of interconnected networks that consist of simple units.

Conscious:Having knowledge of something external or internal to oneself; being aware of and responding to one's surroundings.

Conscious experience: The first-person perspective of a mental event, such as feeling some sensory input, a memory, an idea, an emotion, a mood, or a continuous temporal sequence of happenings.

Dissociative Amnesia: A dissociative disorder characterized by failure to recall important information about one's personal experiences, usually of a traumatic or stressful nature, that is too extensive to be explained by normal forgetfulness.

[47] https://nmoer.pressbooks.pub/cognitivepsychology/back-matter/322/

Divergent Thinking: Creative thinking in which an individual solves a problem or reaches a decision using strategies that deviate from commonly used or previously taught strategies.

Divided attention

Attention to two or more channels of information at the same time, such that two or more tasks can be performed concurrently.

Empiricism

A philosophical view that true knowledge comes primarily from sensory experience and empirical evidence.

Encoding

The conversion of a sensory input into a form capable of being processed and deposited in memory. Encoding is the first stage of memory processing.

EpisodicMemory

The ability to remember personally experienced events associated with a particular time and place.

ExplicitMemory

Also: Declarative Memory. Long-term memory that can be consciously recalled: general knowledge or information about personal experiences that an individual retrieves in response to a specific need or request to do so.

Fluentaphasias

Where speech remains fluent, but content may be lacking, and the person may have difficulties understanding others.

FunctionalFixedness

The tendency to perceive an object only in terms of its most common (or intended) use.

FunctionalMagnetic Resonance Imaging (fMRI)

Functional magnetic resonance imaging (fMRI): A neuroimaging technique that infers brain activity by measuring changes in oxygen levels in the blood.

Generalizability

How representative findings from the study are to the rest of the people we are curious about.

Gestalt

Literally, form or pattern (German). A perceptual configuration made up of elements such that the whole is different from the sum of its parts.

Gestaltprinciples

Principles/laws of human perception that describe how humans group elements and recognize patterns.

Heuristic

In cognition, an experience-based strategy for solving a problem or making a decision that often provides an efficient means of finding an answer but cannot guarantee a correct outcome.

Hypotheses

Predictions with testable implications that can be measured by an experiment.

IconicMemory

The brief retention of an image of a visual stimulus after the end of the stimulus (typically less than a second).

.

Implicit Memory

Memory for a previous event or experience that is produced indirectly, without an explicit request to recall the event and without awareness that memory is involved.

Inattentional blindness

The failure to notice a fully visible, but unexpected, object or event when attention is devoted to something else.

Insight

The (apparent) clear and often sudden discernment of a solution to a problem by means that are not obvious and may never become so, even after one has tried hard to work out how one has arrived at the solution.

Intelligence

The ability to derive information, learn from experience, adapt to the environment, understand, and correctly utilize thought and reason.

Introspection

Self-reflecting upon or scrutinizing aspects of your own cognition.

Long-term Memory (LTM)

A relatively permanent information storage system that enables one to retain, retrieve, and make use of skills and knowledge hours, weeks, and sometimes years after they were originally learned.

Long-term Potentiation (LTP)

A persistent increase in synaptic efficacy or strength following high-frequency stimulation of a chemical synapse.

Mental Set

A temporary readiness to perform certain psychological functions that influences the response to a situation or stimulus, such as the tendency to apply a previously successful technique in solving a new problem.

The result of developing a more positive attitude towards a stimulus after repeated instances of mere exposure to it.

Mindfulness

A state of heightened focus on the thoughts passing through one's head, as well as a more controlled evaluation of those thoughts (e.g., do you reject or support the thoughts you're having?).

a state of heightened focus on the thoughts passing through one's head, as well as a

Mnemonic

Any device or technique used to assist memory, usually by forging a link or association between the new information to be remembered and information previously encoded.

Negative Transfer of Learning/Training

A process in which previous learning obstructs or interferes with present learning. For instance, tennis players who learn racquetball must often unlearn their tendency to take huge, muscular swings with the shoulder and upper arm.

Nonfluent aphasias

Where speech is very halting and effortful and may consist of just one or two words at a time.

Operant Conditioning

A behaviourist approach to learning in which a behaviour comes to be associated with a related subsequent event (consequence). Through this process, behaviours followed by reinforcement are strengthened while those followed by punishment are weakened.

Perception

The psychological process of interpreting sensory information.

Pragmatics

The elements of communication that are not part of language content but help us understand its meaning.

Problem Representation

An individual's scheme that represents the relations among elements of a problem they wish to solve.

Problem solving

The process by which individuals attempt to overcome difficulties, achieve plans that move them from a starting situation to a desired goal, or reach conclusions through the use of higher mental functions.

Procedural Memory

Long-term memory for the skills involved in particular tasks. Procedural memory is demonstrated by skilled performance and is often separate from the ability to verbalize this knowledge. Typically considered a type of implicit memory.

Productive Thinking

In the theory of Erich Fromm, thinking in which a given question or issue is considered with objectivity as well as respect and concern for the problem as a whole.

Rationalism

A philosophical view suggesting that truth can be determined from reason and logic; it does not require direct sensory experience or physical evidence.

Retrieval

The process of recovering or locating information stored in memory.

Retrograde Amnesia

A disturbance in memory marked by the inability to recall previously learned information or past events.

Selective attention

Concentration on certain stimuli in the environment and not on others, enabling important stimuli to be distinguished from peripheral or irrelevant ones.

Selective listening

A method for studying selective attention in which people focus attention on one auditory stream of information while deliberately ignoring other auditory information.

Semantic Encoding

cognitive encoding of new information that focuses on its meaningful aspects as opposed to its perceptual characteristics

Semantic Memory

Memory for general factual knowledge and concepts, of the kind that endows information with meaning and ultimately allows people to engage in such complex cognitive processes as recognizing objects and using language.

Sensation

The physical processing of environmental stimuli by the sense organs.

Sensory memory

Brief storage of information from each of the senses (in a relatively unprocessed form beyond the duration of a stimulus).

Short-term Memory (STM)

The reproduction, recognition, or recall of a limited amount of material after a period of about 10-30 seconds. STM is often theorized as a separate memory system from long-term memory (LTM).

Storage (Retention)

Persistence of learned behaviour or experience during a period when it is not being performed or practiced, as indicated by the ability to recall, recognize, reproduce, or relearn it.

Structuralism

A school of American psychology that sought to describe the elements of conscious experience.

Tacit knowledge

In the context of imagery, the idea that we have knowledge of the world stored without awareness and we apply such knowledge to our expectations of how we manipulate and scan mental representations.

The Scientific Method

An empirical method of knowledge acquisition that relies on observation and experimentation to support declarations regarding human behaviour and mental processes.

Top-down processing

Information processing in which higher level knowledge, expectations, and concepts influence the processing of lower level (e.g. sensory) information.

Trial and Error

To attempt different solutions to a problem until the problem is solved; typically utilized by non-experts.

Unconscious

Not conscious; the part of the mind that affects behaviour though it is inaccessible to the conscious mind.

Unconscious

Not conscious; the part of the mind that affects behaviour though it is inaccessible to the conscious mind.

UnconsciousInference

The making of automatic assumptions (or inferences) about the world based on experience with the environment.

Working Memory

A more recent conceptualization of short-term memory involved in the brief retention (and retrieval) of information in a highly accessible state.