

PSYC 441

Cognitive Psychology II

Session 1 – Brief History of Cognitive Psychology

Lecturer: Dr. Benjamin Amponsah, Dept., of Psychology, UG, Legon
Contact Information: bamponsah@ug.edu.gh



UNIVERSITY OF GHANA

College of Education

School of Continuing and Distance Education

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Session Overview

- This section introduces you to the historical antecedents of the field of Cognitive Psychology. The section provides you with a useful framework to enable you to follow contemporary issues in the field. The field shares the overall history of mainstream psychology in its development through the various schools.

Session Objectives

- At the end of the session, the student will be able to
- describe the roots of cognitive psychology from the classical Greek philosophers
- describe how the field was influenced by the developments in the nineteenth century
- mention the personalities who influenced the development of the field

Session Outline

The key topics to be covered in the session are as follows:

- Topic One: Historical Antecedents
- Topic Two : Years of Introspection
- Topic Three: Years of Functionalism
- Topic Four: Behaviorism
- Topic Five: Gestalt/Study of Individual Differences



Reading List

- Ashcraft, M. H. (2013). *Cognition* (6th edn.), London: Pearson Education Int.
- Eysenck, M. W. (2012). *Fundamentals of Cognition* (2ed). Psychology Press, Sussex.
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- Hunt, R. R. & Ellis, H. C. (2004). *Fundamentals of Cognitive Psychology* (7th edn.), New York: McGraw-Hill.
- Willingham, D, B. (2013). *Cognition: The thinking animal (International edn.* NJ: Prentice-Hall).

Topic One

HISTORICAL ANTECEDENTS



Historical Antecedents

- **THE SCOPE OF COGNITIVE PSYCHOLOGY**
- The processes of remembering, comprehending, decision making, judgment about evidence, problem solving – all fall squarely within cognitive psychology.
- In its modern form, cognitive psychology is an enterprise of about 7 decades old.
- Classic, pioneering research was conducted in the 1950s (Broadbent, 1958; Miller, 1956 etc).
- The first modern text book was published in 1967 by Neisser (***Cognitive Psychology***).

- Cognitive psychology was often understood as the ***scientific study of knowledge***. That's how knowledge is acquired, retained and made available when needed.
- This included of topics like perception, memory, thinking and so on.
- Certain ideas about mental abilities date back to at least the Greek philosophers – Aristotle and Plato. Both of them wrote extensively on the nature memory.

ANTECEDENTS

- Plato e.g., likened storing something in memory to writing on a wax tablet which would survive for a long time.
- He also compared the mind to an aviary in which you are catching a bird. Sometimes you catch the right bird or you may miss the target bird. Clearly they had a fair idea about human memory.
- Other historians of psychology trace the field's roots to philosophers of the 17th to 19th centuries e.g.,
 - **John Locke, David Hume, Stuart Mill,**
 - **Rene Descartes and Immanuel Kant.**

- These philosophers also debated the ***nature of mind and knowledge***, with Locke, Hume and Mill following **Aristotle** and a more ***empiricist position***.
- While Descartes and Kant aligned with **Plato** with a ***nativist position***.
- ***Empiricism*** –
- Philosophical doctrine that emphasizes the role of experience in the acquisition of knowledge. They recognize individual differences in genetics but do emphasize malleable or the changeable aspects of human nature.

- For example, according to John Locke - all knowledge comes through the senses. There are no innate ideas; at birth, the human mind is a blank tablet, *a tabula rasa*, upon which experience leaves its marks.
- One mechanism by which such learning is thought to take place is through the mental association of ideas. The environment plays a powerful role in determining one's intellectual abilities.
- ***Nativism*** –
- By contrast emphasizes the role of constitutional factors over the role of learning in the acquisition of abilities and tendencies.

- **Nativism** is an important idea in cognitive psychology. It is believed “**hard-wired**” functions such as short-term memory (STM) are attributed to innate structures of the human mind and are present in at least rudimentary form at birth and are not learned, formed or created as a result of experience.

Historical roots within Psychology

- Different schools of Experimental Psychology that laid the foundation for cognitive psychology are;
 - ***Structuralism;***
 - ***Functionalism;***
 - ***Behaviorism;***
 - ***Gestalt Psychology etc***

Topic Two

YEARS OF INTROSPECTION



Years of introspection

- The birth date of modern psychology is given as **1879**, the year **Wilhelm Wundt** (Voont) established the first formal psychology research laboratory at the University of Leipzig in Germany.

STRUCTURALISM (Years of Introspection)

- Wundt was the first to call himself a psychologist.
- His original laboratory consisted of one classroom, which he filled with equipment largely made by himself. He developed the first systematic approach to psychology, now called **structuralism**.

- The theory explored structure of conscious experience –
What a person was aware of during an experience.
- Structuralists believed that psychology should concern itself with the elementary processes of conscious experience.
- **They considered three primary questions:**
 - *What are the elements of experience?*
 - *How are they combined?*
 - *What causes the elements to combine?*
- Three major components of conscious experience were identified:

- **Components of Experience:**
 - **Sensations** include sights, sounds, smells, tastes and feelings
 - **Images** represent experiences not actually present, such as memories and
 - **Affections** which pertain to emotional reactions, such as love, joy and jealousy .
- These elements of experience were combined into normal conscious experience **by the process of association.**
- In an attempt to observe conscious experience, Wundt used a technique of **introspection** which means **“inward perception”**.

- Evaluation of Introspection
- Introspection proved to be unreliable because practitioners could not agree on what constitute the elementary parts of the same experience.
- Despite such limitations “**looking inward**” still had a role as in studies of hypnosis, meditation, drug effects, problem solving, moods and description of other private experiences.
- By 1920, structuralism had been pushed from the forefront of the field.

- Today scholars are convinced that **unconscious thought** plays an important role in our mental lives.
- If I ask you what is your ***index no?*** You will need to look up this information from your memory (unconscious) and bring this to awareness (consciousness).
- If we relied on introspection as our means of studying mental events, then we would have no way of examining these processes.
- Science demands verification and testability. So there must be a way of testing assertions made by someone (or there must be a scientific way of confirming or disconfirming claims by introspectors).
- This was not possible! So with introspection the ***scientific demand of testability was often unattainable.***

- **Important Notes on Introspection**

- The debate about unconscious phenomena is interesting. If we believe there is **unconscious thought** then by logic, introspection must be inadequate, since by definition, **introspection is about conscious experiences.**
- There is little agreement among introspectionists about experience.
- Due to the extent of the pathology of the mind, self report is hardly to be trusted.

- Introspective knowledge cannot have the ***generality we expect of science***. Only few people could be trained to do it.
- Much of behavior (habit and performance) occurs without conscious awareness. (a child who licks the thumb, in speech etc)
- Others believed ***introspection*** was in reality ***retrospection*** because recalling experience will not be instantaneous. There will be time lapse between the experience and recall.

Topic Three

YEARS OF FUNCTIONALISM



Years of Functionalism

Unlike structuralism which developed in Germany and was transported to the US, **Functionalism** grew up in the US. It was so named because it emphasizes on *how the mind functions to adapt to our environment*.

Functionalism was strongly influenced by Darwin's theory of evolution (survival of the fittest) which was so influential among intellectual circles in both Europe and North America in the late 1800s.

- Definition by Boring (1950), functionalist psychology is concerned with *“success in living, with the adaptation of the organism to its environment”*.

Years of Functionalism

- Whereas **structuralists** asked questions about the contents of the mind, **Functionalists** were interested in the uses (functions) of mental processes.
- **Functionalists** favored problems of practical significance which meant studying mental activity and behavior in their natural context. **Structuralists** were interested in theory and laboratory experiments.
- Functionalists argued that *because psychological processes are continuous ongoing events*, they could not be reduced to *discrete parts*.

Years of Functionalism

The Effect of Functionalism to Modern Psychology

- Functionalism broadened the scope of psychology to include the ***study of children and animals*** (chimpanzees, dogs, rats etc) that could not be studied through analytic introspection under structuralism.
- It also promoted ***educational psychology*** – which is the study of learning, teaching, classroom dynamics and related topics.

Years of Functionalism

- Functionalism also spurred the rise ***of industrial psychology*** – the study of people at work.
- Functionalists were the first to ***develop intelligence tests*** to classify children (e.g., gifted, mentally retarded etc).



Topic Four

BEHAVIORISM



Behaviorism

- This is another school of psychology that developed in North America.
- Behaviorism can be dated from 1913 when John B. Watson published a paper entitled: *“Psychology as the behaviorist views it”*, in which he stated that psychology should be – *“the science of behavior”*. That is, *the study of overt, observable behavior*.
 - Trained in the functionalist tradition, he rejected its tenets and announced that psychologist should focus on behavior instead of the mind, mental processes and conscious experience.

Behaviorism

- Watson attacked structuralism's emphasis on introspection, consciousness and mental content as inappropriate for scientific explanation.
- He could study animal behavior even though he couldn't ask animals questions or know what they were thinking.
- He simply observed the relationship between **stimuli** (*events in the environment*) and an animal's **responses** (*any muscular action, glandular activity, or other identifiable behavior*).
- He argued that this same logic could be used to study humans.

Behaviorism

◆ He stated emphatically:

“Give me a dozen healthy infants, well-formed, and my own special world to bring up in and I’ll guarantee to take one at random and train him to become any type of specialist I might select – doctor, lawyer, artist, merchant-chief, and yes, beggarman and thief” (Watson, 1913).

- Most psychologists consider Watson’s claim an overstatement.
- Behaviorism profoundly affected psychology to become a natural science rather than a branch of philosophy.
- Behaviorism dominated psychological research from the 1920s through to 1960s almost to the neglect of the mind and mental processes.

- One of the best-known modern behaviorist is **B. F. Skinner** (1904-1980).
- He believed that our behavior is controlled by **rewards**, or **positive reinforcers**. *“Behavior is shaped and maintained by its consequences”*.
 - Behaviorists deserve credit for discovering much of what we know about learning, conditioning and the proper use of reward and punishment.
 - Behavior modification is another valuable product of behaviorism (*where learning principles are used to change problem behaviors such as overeating, phobias or temper tantrums*).

- *Criticisms*
- They rejected the use of mental or biological constructs as explanations for behavior.
- Early behaviorists excluded many topics from psychology – such as perception, emotion and cognition that are of primary concern today.
- In general, Watson’s contribution to cognitive psychology was **negative** in the sense that he called for the **banishment** of all mental language from use in psychological research.
- Other behaviorists like Skinner, Tolman were more accommodating but called on psychologist to develop more rigorous and more testable hypotheses and theories, as well as stricter research protocols in studying behavior.

Topic Five

GESTALT /THE STUDY OF INDIVIDUAL DIFFERENCES



Gestalt Psychology

GESTALT PSYCHOLOGY

- The school began in Frankfurt, Germany. Three important psychologists for the school are: **Wertheimer, Koffka and Köhler**.
- “Gestalt” is a German word loosely translated as “configuration” or “shape”.
- The central assumption of this school was that psychological phenomena could not be reduced to simple elements but rather had to be analyzed and studied in their entirety or in wholes.
- Their main area of study was perception and problem solving; they believed that an observer constructs an experience from the total structure as wholes and not from elementary sensory aspects of experience.

- This school rejected **structuralism, functionalism** and **behaviorism** as incomplete accounts of psychological and cognitive experiences.
- They believed that the mind itself imposes its own structure and organization on stimuli into **wholes** rather than discrete parts.

Genetic Epistemology

- This is a Piagetian idea of cognitive development of infants.
- Piaget was largely sympathetic to the Gestalt idea that the relationship between parts and wholes is complex.
- Piaget described the intellectual structures underlying cognitive experience at different developmental stages through an approach he called ***genetic epistemology***.

- His observation of infants and children convinced him that a child's intellectual structures differ qualitatively from those of a mature adult.
- See Figure 1.1 below.

Sensorimotor	Birth - 2 years	<ul style="list-style-type: none">-Identifies object permanence: the object still exists when out of sight-Recognition of ability to control objects and acts intentionally
Preoperational	2 - 7 years	<ul style="list-style-type: none">-Begins to use language-Egocentric thinking: difficulty seeing things from other viewpoints-Classifies objects by single feature: example- color
Concrete Operational	7 - 11 years	<ul style="list-style-type: none">-Logical thinking-Recognizes conservation of numbers, mass and weight-Classifies objects by several features and can place them in order
Formal Operational	11 years and up	<ul style="list-style-type: none">-Logical thinking about abstract propositions-Concerned with the hypothetical and the future-Create hypotheses and test

Individual Differences

- Piaget's contribution to cognitive psychology is seen in child development.

The Study of Individual Differences

- This is another strand of history which is not associated with any “school”. However, much of the work on individual differences in human cognitive abilities owes much to the work of **Sir Francis Galton** and his followers.
- Galton (1883/1907) – half cousin of Charles Darwin studied a variety of cognitive abilities, focusing on ways of measuring the ability and then noting its **variability** among different individuals.

- Galton left much legacy to psychology and to cognitive psychology. In particular for:
- His invention of tests Questionnaires to assess mental abilities inspired cognitive Psychologist to develop similar tests.

Sample Questions

- Describe how research on cognitive development and individual differences might bear on cognitive psychology.
- Compare the following approaches to psychology, with respect to their emphasis on cognitive psychology
 - Structuralism
 - Functionalism
 - Behaviorism

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