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Presents

Course Title:

Basic Cognitive Processes

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Lecture 03: A Brief History of Cognitive Psychology contd…

Behaviorism

- Other psychologists operating at the same time as Thorndike began using animal experiments to probe *stimulus – response* relationships in slightly diferent ways.

- Those experiments led to the emergence of a field called ***behaviorism.***

- Behaviorism focused primarily on the relation between observable behavior and environmental stimuli.

- The idea was to move towards the *physical* from the *mental*.

- Russian physiologist, Ivan Pavlov (1849 – 1936) studied the effects of pairing two comlpetely unrelated stimuli on learning.
- He found out that when paired:
  - food > salivating response.
  - food + bell > salivating response.
  - bell > salivating response.
- ***Classical conditioning.***

Image: http://sciencepenguin.com/wp-content/uploads/2013/08/kapak2.jpg

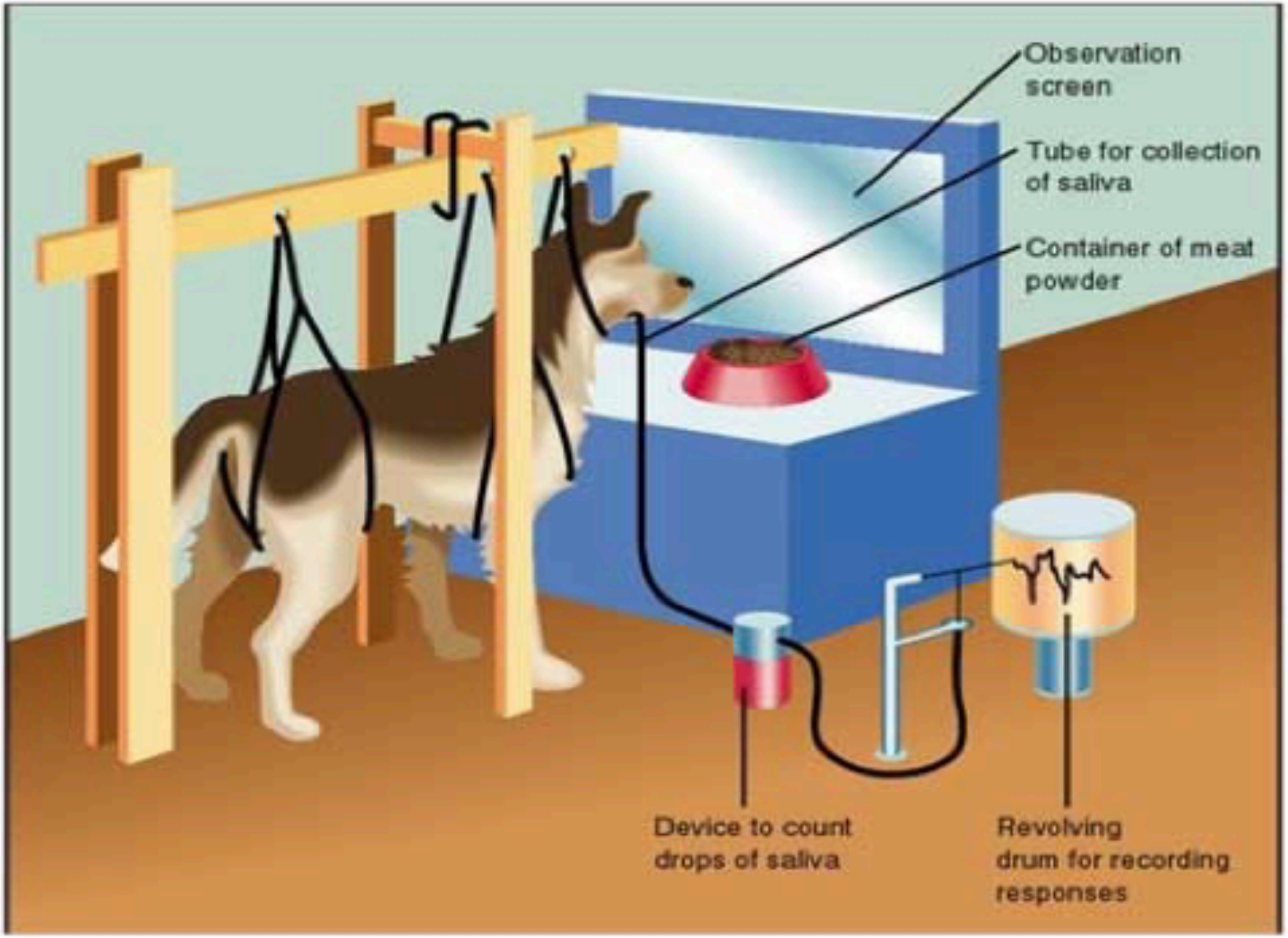

Image: https://www.simplypsychology.org/Pavlov.jpg

- John B. Watson (1878 - 1958)
  - founded *behaviorism*
  - based on the premise that it is not possible to objectively study the mind.
  - psychologists should limit their attention to the study of behaviour (overt) itself.
  - mind is a "black box".
  - no point in trying to determine, when we can predict behaviour.

Image: http://humanbehaviorexpert.com/wp-content/uploads/2014/10/john-watson-6.jpg

- B .F. Skinner (1904-1990)
  - used *reinforcements & punishments* to modify behavior.
  - used theses principles to develop theories about how to teach children & create peaceful societies.
  - influenced a lot of marketing strategies.
  - ***Operant conditioning***

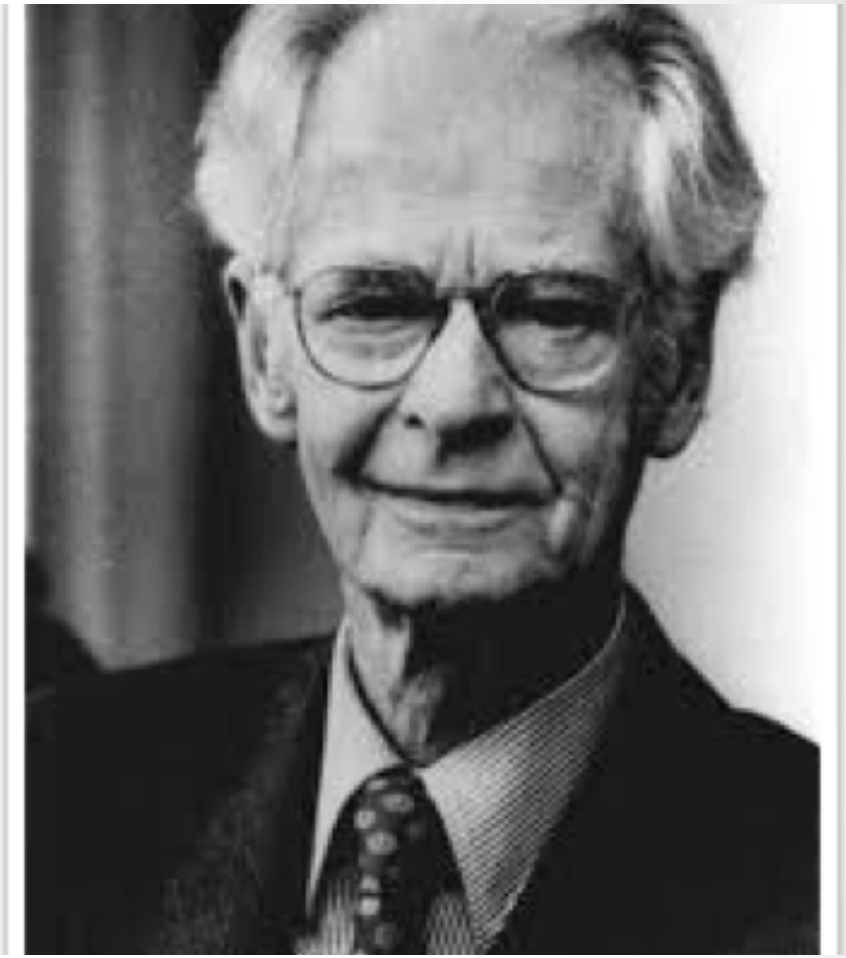

Image: http://www.childdevelopmentmedia.com/psychology/giants-of-psychology-b-f-skinner-a-fresh-appraisal/

Gestalt Psychology

- States that we best understand psychological phenomena when we view them as organised, structured wholes.
- Acc. to this view, we cannot fully understand behavior when we only break phenomena down into smaller parts.
  - For examples: while behaviorists chose to study problem solving by looking for observable behavioral correlates gestaltists would look to study the same through *insight*, i.e. the unobservable mental event by which someone goes from having no idea about how to solve a problem to understanding it fully in a mere moment of time.

- They believed in the maxim, “the whole is more than the sum of its parts”.

- To understand the perception of a flower, for example, we would have to take into account the whole of experience.

- We cannot simply understand the perception of a flower merely in terms of a description of its form, colour, size, smell or so on.

Emergence of Cognitive Psychology

The beginning…

- In the early 1950s, a movement called the ***cognitive revolution*** took place in response to behaviorism.

- ***Cognitivism*** rejects the notion that psychologists should not study the mental processes because they are unobservable; instead it looks to develop menthods & ways to study the internal workings of the mind.

- the field focuses on studying mental processes like perception, thinking, memory, language etc.

Preceding events…

- ***Influence of Psychobiology***
  - **Karl Lashley** (1890 – 1958) challenged the behaviorist view that human brain is a passive organ, merely responding o the environmental contingencies outside the individual (Gardner, 1985).
  - brain to be an active, dynamic organiser of behavior & sought to understand how the macro – organisation of the human brain made possible such complex ,planned activities as a sport activity, musical performance, language use etc.
  - Through his experiments with rats he concluded that memory is not localized rather distributed in the several regions of the brain.

Image: https://carnets2psycho.net/images/lashley.jpg

- Donald Hebb (1949) proposed the same concept of cell assemblies as the basis for learning in the brain.
- Cell assemblies are coordinated neural structures that develop through frequent stimulation.
- The develop over time as the ability of one neuron to stimulate firing in a connected neuron increases.

Image: http://www.spektrum.de/lexika/images/bio/f3f3731_w.jpg

- the attack on Skinner's ***Verbal Behaviour***
  - While a definite reaction against behaviorism was already brewing , Skinner wrote an entire book describing how language acquisition and usage could be explained purely in terms of environmental contingencies.
  - Linguist **Noam Chomsky (1959)** wrote a scathing review of Skinner's ideas.
  - Chomsky stressed both the biological & the creative basis of language.

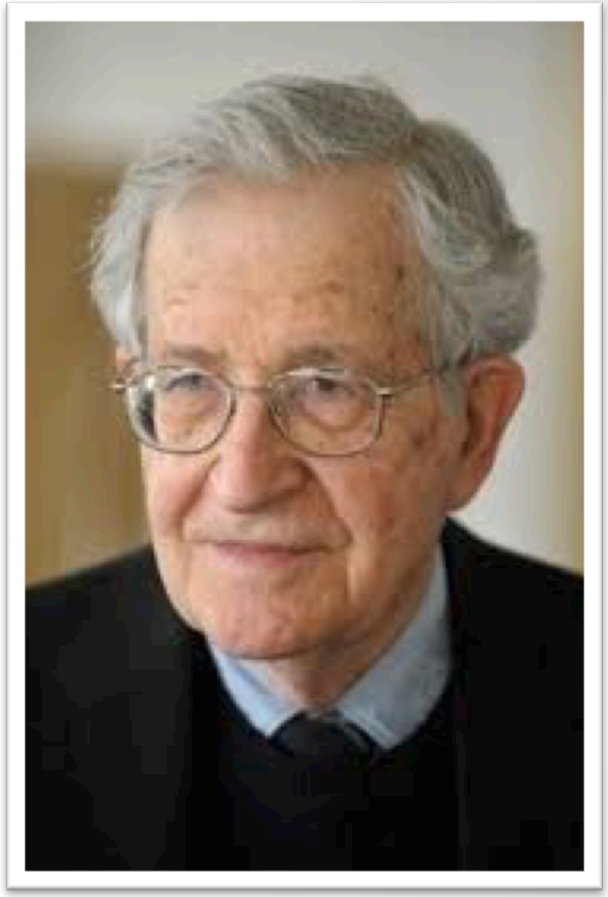

Image: http://www.thirdworldtraveler.com/PageMill_Images/noamchomsky.jpg

- He pointed out the infinite numbers of sentences that we can produce with ease without having learned them through either conditioning or instruction.

- He thereby defied the notion that we learn language through reinforcement.

- A similar idea, that what is leaned must often be more abstract than straightforward stimulus response associations, was also expressed by **Edward Tolman** (1932).

- Through his experiments with rats, he proposed that rats do not learn to navigate a maze through merely a system of rewards/ punishments , rather by actively processing information.

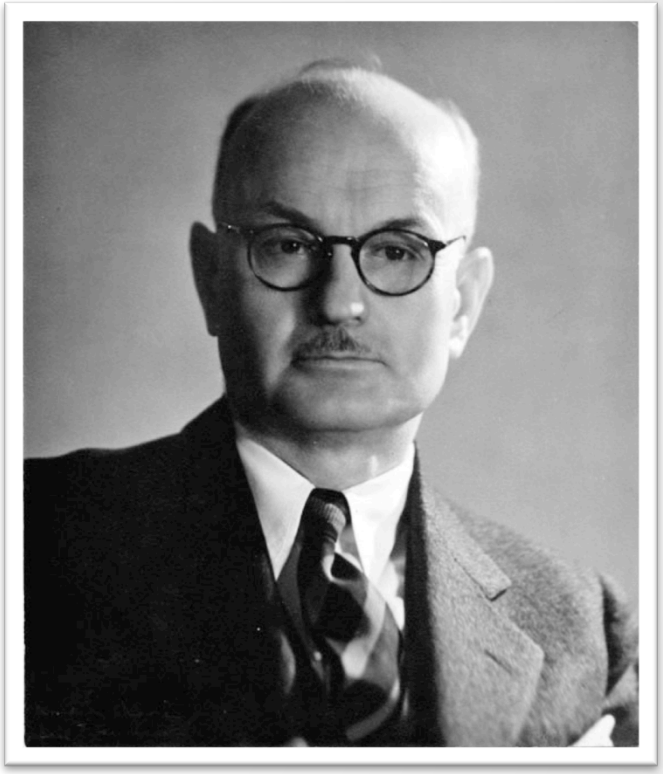

Image: https://alchetron.com/Edward-C-Tolman-1271730-W

- ***Influence of technology***

  - by the end of te 1950s, psychologists were intrigued by the notion of whether machines could be programmed to demonstrate intelligent behavior.

  - Turing (1950) suggested that soon it would be hard to distinguish the communication of machines from that of humans.

  - He suggested a test, now called the ***Turing Test*** , by which a computer program would be judged successful to the extent that its output was indistinguishable, by humans.

  - The computers of the time passed the Turing Test (Schonbein & Behctel, 2003).

- By 1956, a new phrase erupted on the scene, called ***Artificial Intelligence***, i.e. an attempt by humans to construct systems that show intelligence or more precisely, intelligent processing of information.

- By the early 1960s, there were other developments in the fields of psychobiology, linguistics, anthropology & artificial intelligence which were now converging to create an entirely new era & approached towards studying the human mind.

- Early cognitive psychologists like George Miller, Alan Newell, Shaw & Herbert Simon argued that the traditional behaviorist accounts of behaviour were inadequate because they said nothing about how people think.
- George Miller (1956) introduced the concept of ***channel capacity*** wherein he proposed that the upper limit with which an observer can match a response to information given to him or her is about 7.

    - If you can remember seven digits presented to you sequentially, your channel capacity for remembering digits is 7.

- Ulric Neisser's book ***Cogniitve Psychology*** (Neisser, 1967) was especially critical in bringing cognitivism to prominence by informing the undergarduates, graduate students & academics about the newly developing field.

- Neisser defined *cognitive psychology* as the study of how people learn, structure, store and use knowledge.

- Subsequently, Allen Newell & Herbert Simon (1972) proposed detailed models of human thinking and problem solving from the most basic levels to the most complex.

- By the 1970s, cognitive psychology was recognized as a major field of psychological study with a distinctive set of research methods.

To summarize…

- So, in today's lecture I took you on a ride through the origins of the main ideas & approaches that lead to the development of ***Cognitive Psychology***

- It might be an interesting to slowly go over & make a connection from:
  - The ideas of rationalism vs. empiricism.
  - The early philosophical thought about mind & body.
  - The early schools of psychology.
  - The cognitive revolution.

References

- Sternberg, R.J. & Sternberg K. (2012). Cognitive Psychology. 6th Ed. *Cengage Learning*.

- Braisby, N. & Gellaty, A. (2005) Cognitive Psychology. 1st Ed. *Oxford University Press*.