

WEEK 2- INTRODUCTION TO COGNITIVE PSYCHOLOGY

What is cognitive psychology?

Was first understood as a scientific study of knowledge;

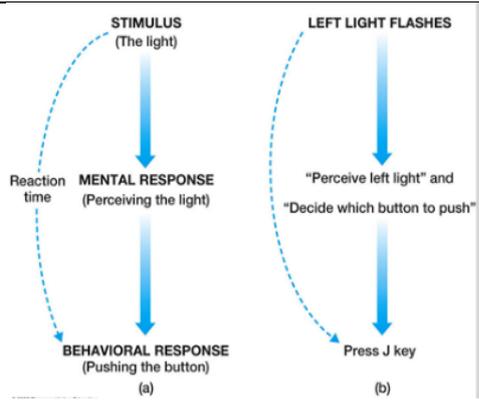
- How is knowledge acquired, remembered and used

Cognitive psychology is; Behaviours -Feelings -Thoughts -Choices

Our previous experience with knowledge creates expectations, which affects our processing of information this is known as TOP-DOWN PROCESSING.

TOP-DOWN PROCESSING is influenced by our expectations and knowledge, rather than the stimulus itself. EG; Paris in the the spring (our expectation) but what it actually reads is Paris in the spring (without the double 'the'- This is an example of the actual stimulus; so what is actually written).

A brief history of cognitive psychology

Person	School	Say
Wilhelm Wundt (1832-1920).		 <p>The diagram illustrates two experimental setups, (a) and (b). Setup (a) shows a 'STIMULUS (The light)' leading to a 'MENTAL RESPONSE (Perceiving the light)', which then leads to a 'BEHAVIORAL RESPONSE (Pushing the button)'. A dashed arrow labeled 'Reaction time' connects the stimulus to the behavioral response. Setup (b) shows a 'LEFT LIGHT FLASHES' leading to a mental response: '"Perceive left light" and "Decide which button to push"', which then leads to the 'Press J key' behavioral response. A dashed arrow connects the stimulus to the behavioral response.</p>
Wundt and his student Edward Titchener		<p>Used analytical <i>introspection</i>.</p> <ul style="list-style-type: none"> - Participant were trained to describe their experiences and thought processes when elicited by stimulus presented under controlled conditions. - These participants were introspectors and were given a vocabulary to report on what they were experiencing.
Titchener,	Thought; problem with introspection is that its hard to test its claims (objective observation needed).	<p>Problem with the mind and introspection; William James (1842-1919)</p> <ul style="list-style-type: none"> - The mind does what it does and this was claimed by William James which was from the Functionalism school of thought; description of mental processes in terms of their function or adaptive significance. Theorised about primary/secondary memory. - Important to describe mental processes
John Watson	Behaviourism reaction to	<ul style="list-style-type: none"> - Concerned with the prediction and goal of behaviour; behaviour explained as a product of learning and classical conditioning.

Eg of what was tested in Wundt lab. He tested reaction times, word association etc using both behavioural and physiological studies. Voluntarism

(1878-1958)	introspection and invisible mental processes	- Pavlov's work and study was in favour of this school
B.F Skinner 1939s and 1940s,	Study of Operant Conditioning	- Learning process through which a response increased as a result of reward or reinforcement or when reinforcement is contingent on a response being emitted - Stimulus response elements. - Society environmental impact behaviour and that we should maximise society environment positive to influence humans potential.

What is Cognitive Revolution; Decline in the influence of behaviourism. A number of factors contributed;

- Noam Chomsky's famous critique Skinner's book and his theory of language
- George Miller discussed the magic number 7 in short term memory
- Broadbent's model of attention which was an information processing model
- Study of Human Performance

NOTE; skinner operant conditioning did not contribute to the psychological movement known as the cognitive revolution.

Research methods in cognitive psychology

Scientific Method is about seeking cause and effect relationships by following a series of steps to systematically investigate the effect of one specific variable on another specific variable. Aim is to ensure that the results are caused by the variable being manipulated and not another extraneous/intervening variable.

Limitation to cognitive psychology

Name	Def	Eg	The ecological validity of the Eg
Ecological Validity-	Findings in the lab are relevant to the real world; - <u>Extrapolating</u> from the lab to the real world - <u>Extrapolating</u> from one situation to the next Implacable experimenter-experimenters behaviour is not influenced by participants behaviour	Eg- little Albert (John Watson)- albert began to fear the rat because of the noise associated with the rat. In saying this Watson believed albert would be then afraid of things that look similar to the rat such as Santa Claus beard.	Ecological Validity with this experiment said by Harris 1970 "Critical reading of Watson report reveals little evidence that Albert developed rat phobia or even that animals consistently evoked his fear during the experiment.
Paradigm Specificity	Occurs when findings with a given experimental task or paradigm are not generalised		

	but are only specific to that paradigm		
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Research Methods in Cognitive Psychology- the 4 main approaches to human cognition	Definition	Issues
Experimental Cognitive Psychology	<ul style="list-style-type: none"> - Obtain measure of accuracy and speed of performance - Theories proposed in verbal terms <p>Aims to understand human cognition by the study of behaviour or brain activity and structure.</p> <p><u>Bottom-up processing</u>= influences by environment stimuli.</p> <p><u>Serial processing</u>=completed before the next one starts.</p> <p><u>Top down processing</u>- influenced from ones past experience.</p> <p><u>Parallel processing</u>- 2 or more cognitive processes occur at the same time.</p>	<ul style="list-style-type: none"> -Ecological validity (how does what we measure in the lab translate to the real world) -Indirect measures -Theories can be vague -Problem of paradigm specificity
Cognitive Neuroscience	<p>Where and when do brain specific processes occur?</p> <p>Techniques</p> <ul style="list-style-type: none"> - Event Related Potentials(ERP) - Functional Magnetic Resonance Imaging (fMRI) - Transcranial Magnetic Stimulation (TMS) <p>Where brain specificity occurs and how long it takes for brain to respond.</p>	<p>Brain activity doesn't provide direct evidence, only associations.</p> <p>specificity is assumed</p> <ul style="list-style-type: none"> - Only true for lower level processing
Cognitive Neuropsychology	<p>Is concerned with patterns of cognitive performance brain damaged patients.</p> <p>Involves using evidence from behaviour and the brain to understand human cognition.</p> <p>The aim is not to learn about the brain but instead learn about the mind.</p> <p>Theoretical assumptions:</p>	<ul style="list-style-type: none"> - Groups VS individuals - Patients can develop compensatory strategies - Usually more than one module is damaged - Individuals differences

	<ul style="list-style-type: none"> - <u>Modularity</u>- cognitive system consists of independent/separate processors each for a specific type of processing. - <u>Domain specificity</u>- given module responds selectively to certain stimuli but not others. - <u>Subtractivity</u>- brain damage impairs one or more process module but doesn't change or add anything <p><u>Dissociation</u>- intact performance on one task but severely impaired performance on a different task.</p> <p><u>Association</u> –performance on 2 tasks are impaired In both</p>	
<p>Computational Cognitive Neuropsychology</p>	<ul style="list-style-type: none"> - Programming computers to model or mimic an aspect of cognitive functioning - Computational modelling (for reading or learning language) <p>TYPES OF MODELS;</p> <p><u>Artificial intelligence</u>; involves constructing computer systems that produce intelligent outcomes but may do so in ways bearing little resemblance to those used by humans.</p> <p><u>Cognitive architecture</u>- understanding human cognition in the form of a computer program</p> <p><u>Connectionist models(connectionism)</u>; the networks exhibit learning through experience and specific items of knowledge are distributed across numerous units.</p> <p><u>Back propagation</u>; allowing a network to learn to associate an input pattern with a given output pattern by comparing actual responses against correct ones.</p>	<p>Arbitrary parameters</p> <p>Emotional and motivated factors not accounted for</p> <p>Neural plausibility questionable</p>