Introduction to Cognitive Psychology

Tuesday, 28 February 2017   4:45 PM

Introduction to Cognitive Psychology

<u>What is Cognitive Psychology</u>
- Cognition is the collection of mental activities used in perceiving, remembering, and thinking, as well as the act of using those processes
- Cognitive Psychology is the scientific study of these mental processes

- Perception (recognise an object)
- Attention (focus in class)
- Memory (remember phone #)
- Concepts (have an idea)
- Language (understanding text)
- Visual knowledge (getting to W building)
- Judgment/decisions (party or study?)
- Reasoning/Problem solving (how can I graduate?)

<u>Brief History of Cognitive Psychology</u>
Roots in philosophy
- Aristotle 384-322 BC - Empiricism, memory & learning - tabula rasa
- Wilhelm Wundt 1832-1920 - 1879 first lab - Mental processes, introspection
- Edward Titchener 1867-1927 - Wundt's student, introspection- Structuralism
- Hermann Ebbinghaus 1850-1909 - Experimental study of memory - Forgetting curve, learning curve - Savings in relearning
- William James 1842-1910 -Everyday psychological experiences -Functionalism - Memory divided based on functions
- Behaviorism 1910s-1950s - Watson -Study observable behaviour -Not the mind, consciousness, thoughts…
- Cognitive revolution late 1950s - World War II - Linguistics - Artificial Intelligence/Computers

<u>Assumptions that we Make</u>
- Mental processes exist
- Mental processes can be studied scientifically
- Behaviour gives us insight into these processes
- Humans are active information processors

<u>Studying Mental Processes</u>
- Our observations need to be reliable and valid
- Reliability refers to a certain level of repeatability when things are measured more than once using the same method
- Validity refers to whether or not we have actually measured what we set out to measure

Object Recognition

<u>Visual Perception</u>
- Vision is dominant sense
- Perceive and recognise objects through:
  - Form perception: see basic size and shape

- Object recognition: identify objects
- But "the whole is greater than the sum of the parts"

What is First?
- Collect information then interpret
- Interpretation happens AS we collect information
- Parallel processing

Object Recognition
- We recognise huge range of objects in multiple contexts
- Context plays a large role in recognition
- Detect presence of relevant features

Advantages of feature-based recognition
1. Features are basic building blocks for objects and words
2. Recognise objects despite variations in size, colour, position
3. Use features for visual searches

Advantages of feature-based recognition
1. Features are basic building blocks for objects and words
2. Recognise objects despite variations in size, colour, position
3. Use features for visual searches
4. Early step that occurs before features assembled into complex whole objects

Word Recognition
- Begins with detection of simple features
- Features put together in brain
- Complete object

Any model needs to be able to explain…
- Familiarity: frequent words better recognised
- Recency: words just seen better recognised
- Word superiority effect

Familiarity
- Frequent or infrequent words
- Viewed rapidly: Tachistoscope (right), Computer
- 65% of frequent words recognised
- 33% of infrequent words recognised

Word Superiority Effect
- Words are easier to perceive than letters by themselves
- E.g., "did you see the letter T" after CART or T
- Faster to recognise that T was present when see CART than when T by itself
- Recognition of letters is superior when letters are in words
- Also occurs for non-words that resemble English words, e.g., glake

Feature Net Models
Readiness to fire
- Determined by starting level of activation
- Influenced by: Frequent use, Recent use
- Explains experimental findings of Frequency, Recency

Facial Recognition
- Evidence for a different system
- Prosopagnosia
- Dependent on viewpoint

Systems for Configurations
- Separate system that is sensitive to viewpoint
- Used for tasks that involve: recognising specific individuals with a category, category is extremely familiar
- Recognition of configurations

Top-Down and Bottom-Up Processing
- Data driven or bottom up processing - Begins with the data
- Concept driven or top down processing - Begins with concept
- Interactive models involve both