



## Chapter 7 – Cognitive Psychology

- I. Information Processing Model
  - a. Computer Model
  - b. Computer I/O, Storage, Processing, Retrieval, Etc.
- II. Conceptual Models
  - a. Observe what happens and determine which structures are involved. E.G. Language acquisition device.
  - b. Deductive Reasoning >> Make conclusions which MUST follow from specific facts. If  $A = B$  and  $B = C$  then  $A = C$ .
  - c. Inductive Reasoning >> Make conclusions based on probability without complete evidence. Inferences, Heuristics. Cognitive Psychology relies mainly on inductive reasoning.
- III. Tools
  - a. EEG, MRI, PET, Brain Scans.
  - b. Event-related potentials >> Very specific brain waves help determine which portions of the brain are determined at different times.
- IV. Concepts
  - a. Mental representations of categories of items or ideas
  - b. Artificial >> Learned Explicitly. Dictionary Definitions / Textbook Definitions
  - c. Natural >> Learned Implicitly
  - d. Concept Hierarchy
    - i. Different levels of concepts.
    - ii. E.G. Living object > Animal > Bird > Red-Breasted Southwestern Sparrow.
    - iii. Most likely to use Basic level ("bird" in example). Basic level is the most meaningful unit generally used.
- V. Syllogism >> Two premises and a conclusion. Deductive.
- VI. Algorithms (Deductive) >> Procedure guaranteed to solve a problem. Example: Computer programs.
- VII. Heuristics >> "Rules of thumb." General way of solving problems, but with no guarantees of an accurate solution.
  - a. "Common Sense" relies on heuristics
  - b. "Exceptions to the rules" cause problems.
  - c. Less accurate but more efficient.
- VIII. Working backward
  - a. Solving a problem without starting at the beginning.
  - b. Example: ... The number doubles daily, half the pond is covered in 60 days, on what day will the pond be half-covered?
    - i. Impossible to solve from the beginning.
    - ii. From the end, it's easy – 59.
- IX. Analogies >> Comparing Situations using similar solutions in similar situations.
- X. Intuition >> Using heuristics, not conscious reasoning. "Gut feelings."
- XI. Obstacles
  - a. Mental Set >> Solve new problems like previous problems even if the methods aren't appropriate or efficient.
  - b. Functional Fixedness >> Thinking of objects with only one function. E.G. Can a screwdriver also be used as a weight?
  - c. Faulty Heuristics >> E.G. Racial Profiling.
  - d. Anchoring Bias >> Focusing on any one aspect of the problem.
    - i. Example: Is  $5 \times 4 \times 3 \times 2 \times 1 = 1 \times 2 \times 3 \times 4 \times 5$ ?
    - ii. Mathematically it is, but asking separate people will result in different answers.
  - e. Representative Heuristic >> Comparing to an example of a certain type. Ex: All accounts are the same, so this accountant must be the same. Results in stereotypes.
  - f. Availability heuristic >> Most commonly available comparison is used. Ex: All doctors must be like television doctors.