

Memory Information Processing Approach

Dr. Jasna Vuk

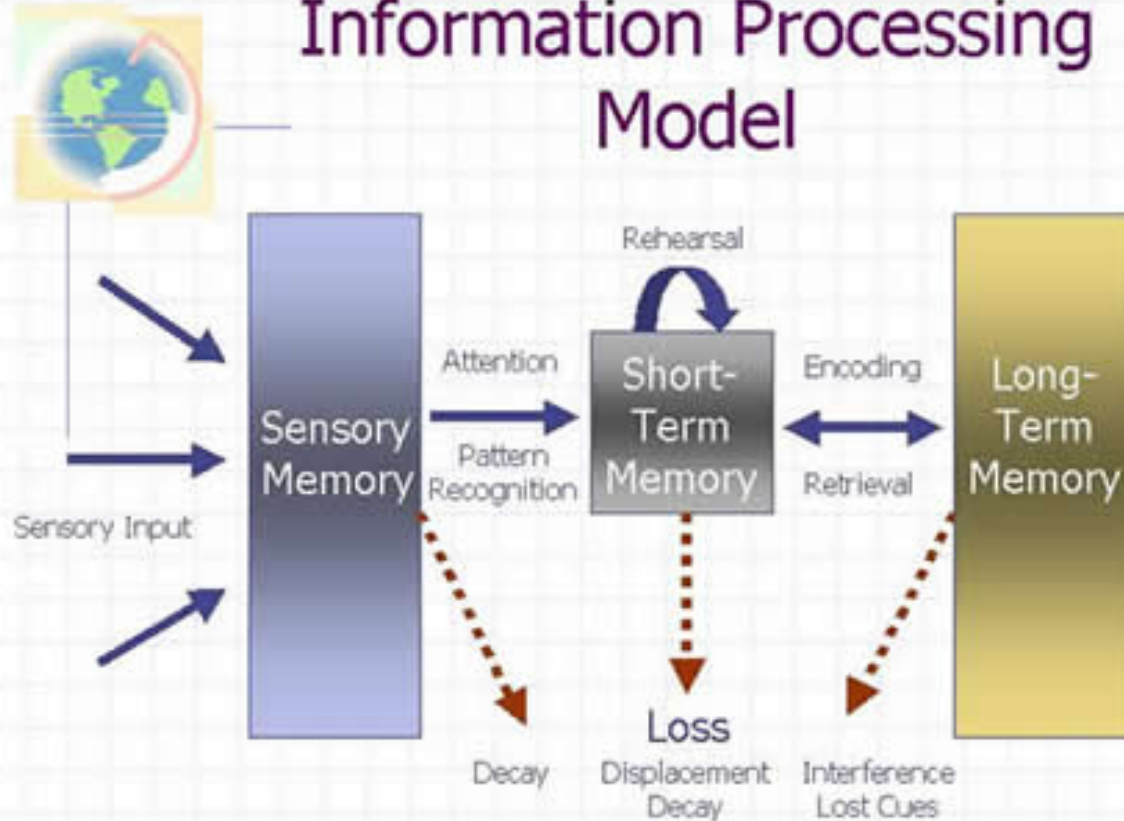
Academic Affairs Student Success Center
University of Arkansas for Medical Sciences

Memory

- ❖ Retention of information over time
 1. encoding
 2. storage
 3. retrieval

- ❖ Flow of information through a system of processors
 1. Sensory memory
 2. Short term memory
 3. Long term memory

Information Processing Model



http://innovativelearning.com/educational_psychology/cognitivism/index.htm

Sensory Memory

- ❖ Information from outside world are held in sensory form (visual, audio etc.); no longer than a second or several seconds
- ❖ Information to which we pay attention is transferred to short term memory

Short Term Memory

- ❖ Limited capacity
- ❖ Duration: information is retained for a short period of time (30s) unless rehearsed and processed further
- ❖ “The Magical Number Seven, Plus or Minus Two” by George Miller (1956)
- ❖ On average, adults can retain 7+ digits
- ❖ Memory span (the number of digits a person can report back without error)

Long-Term Memory

- ❖ Duration: practically permanent
- ❖ Capacity: practically unlimited
- ❖ **Procedural (implicit)**: knowledge about procedures that are unconscious, e.g., riding a bike, tying a shoe
- ❖ **Declarative (explicit)**
 - *episodic* (memory for events, e.g., what you had for breakfast this morning)
 - *semantic* (memory of general knowledge)



```
graph TD; A[Long Term Memory] --> B[Declarative Memory]; A --> C[Procedural Memory]; B --> D[Episodic Memory]; B --> E[Semantic Memory]
```

Long Term Memory

Declarative
Memory

Procedural Memory

Episodic Memory

Semantic
Memory

Retrieval

- ❖ Can be automatic or requires effort
- ❖ Encoding specificity principle

Creating effective cues

- ❖ Associations formed at the time of encoding or learning tend to be effective retrieval cues
- ❖ Short answer or essay questions require recall of previously learned information
- ❖ Multiple choice tests can provide retrieval cues to “recognize” information

Forgetting

- ❖ **Cue dependent forgetting** - lack of effective retrieval cues; it goes back to specificity of encoding
 - ❖ **Interference theory** - other information gets in the way of what we are trying to remember
 - ❖ **Decay theory** - the passage of time is responsible for forgetting
- ❖ Santrock, J. W. (2009). Educational Psychology (4th ed.). New York: McGraw.

Curve of Forgetting

- <http://uwaterloo.ca/counselling-services/curve-forgetting>