Cognitive Processes and Cognitive Structure

• We Can Understand Cognitive Processes, Such As . . .
  – Learning
  – Remembering
  – Perception
  – Attention

• . . . In Terms of Information Flow Within the Cognitive Structure
  – Working memory
  – Long-term memory

Perception

• Dividing and Organizing the Sensory Field
  – Visual
    • People, objects; Figure and ground
  – Auditory
    • Speech is a continuous sound stream

• Top-Down & Bottom-Up Processing
  – Bottom-up begins with sensory details
  – Top-down begins with expectations derived from prior experience

• Perception Creates Meaningful Units (Chunks) in Working Memory
Attention

- Processing Some Information
- Filtering Out Other Information
  - Example: Cocktail party phenomenon
- Influenced By
  - Goals
  - Prior knowledge
- Attention is Gateway to STM (WM)
- Implications for Teaching
  - You must have students’ attention; otherwise, no learning (LTM change)
- Attending Means to Hold Information in Working Memory

Encoding

- Type I Encoding: Rehearsal
  - Simple repetition
  - Rote learning (not meaningful)
  - Write Time from WM to LTM: About 10 seconds per chunk
- Type II Encoding: Elaborative Encoding
  - Making meaningful connections

Encoding Specificity

- The Context for Learning (Encoding) Affects Retrieval
- Examples of Encoding Specificity
  - Physical context
    - Baddeley’s scuba study
  - Emotional context
    - Bower’s experiments
  - Semantic (meaning) context

Example Source:
http://intropsych.mcmaster.ca/intropsych/1a3/Cognition/lec2-2.htm
The Serial Position Curve

- Primacy and Recency Effects
- Interference
  - Proactive near the end
  - Retroactive near beginning
  - Both where?
- Value of Curve for Teaching?
  - The beginning and end of a lesson are crucial
  - Try to reduce informational distractions before and after learning, and so create primacy and recency effects

Forgetting

- Several Possible Explanations
  - Decay
  - Inadequate Retrieval Cues
  - Reconstruction Error
    - Adding plausible but incorrect information to the memory
    - Can be influenced by “leading” questions
    - Eyewitness testimony
- Is Forgetting Adaptive?
  - Zeigarnik effect--“flushing”
  - Eidetic memory
    - Extremely rare
    - Not necessarily adaptive