Chapter 7: Memory

Lecture Overview

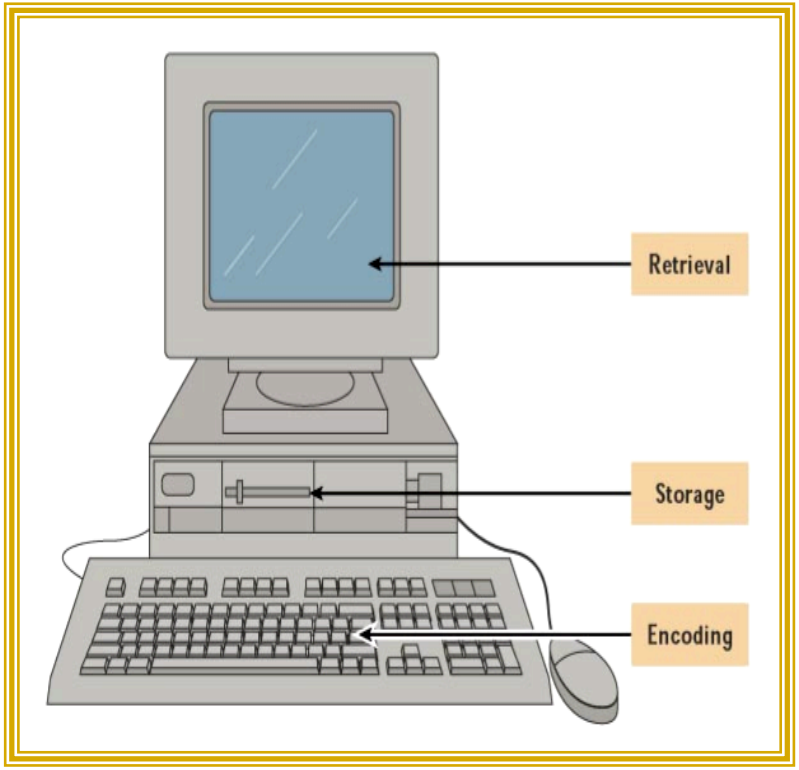
- The Nature of Memory
- Forgetting
- Biological Bases of Memory
- Using Psychology to Improve Our Memory

The Nature of Memory

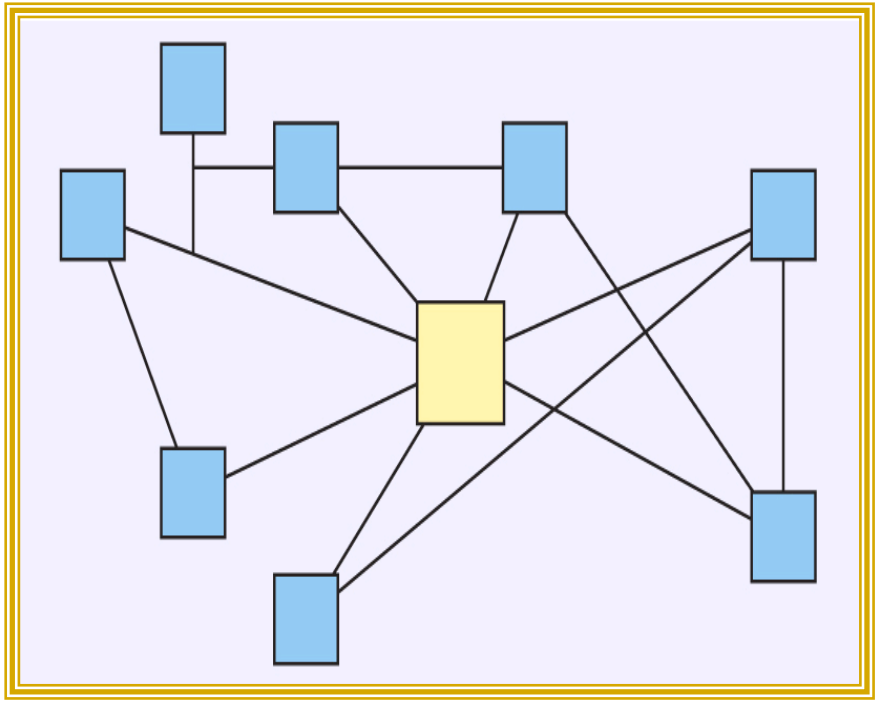
- Memory (an internal record or representation of some prior event or experience)
- Memory is also a constructive process, in which we actively organize and shape information as it is processed, stored, and retrieved.

The Nature of Memory—Description of Four Memory Models

1. Information Processing Approach: memory is a *process* analogous to a computer, which encodes, stores, and retrieves information.



The Nature of Memory—Description of Four Memory Models (Cont.)

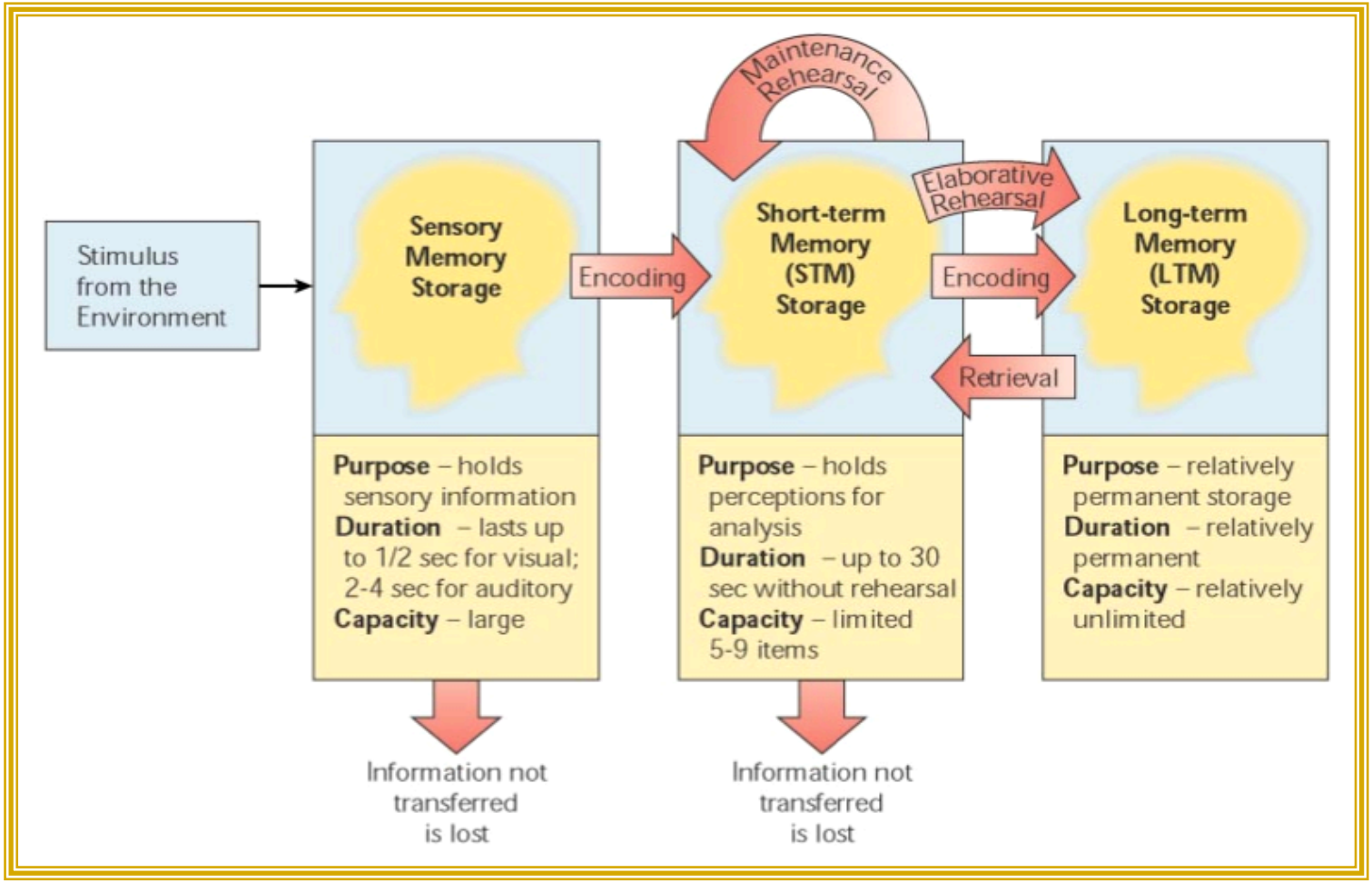


2. Parallel Distributed Processing Model: memory is distributed across a network of interconnected units that work simultaneously (in a *parallel* fashion) to process information.

The Nature of Memory—Description of Four Memory Models (Continued)

3. Levels of Processing Approach: memory depends on the degree or depth of mental processing occurring when material is initially encountered.
4. Traditional Three-Stage Memory Model: memory requires three different storage boxes to hold and process information for various lengths of time.

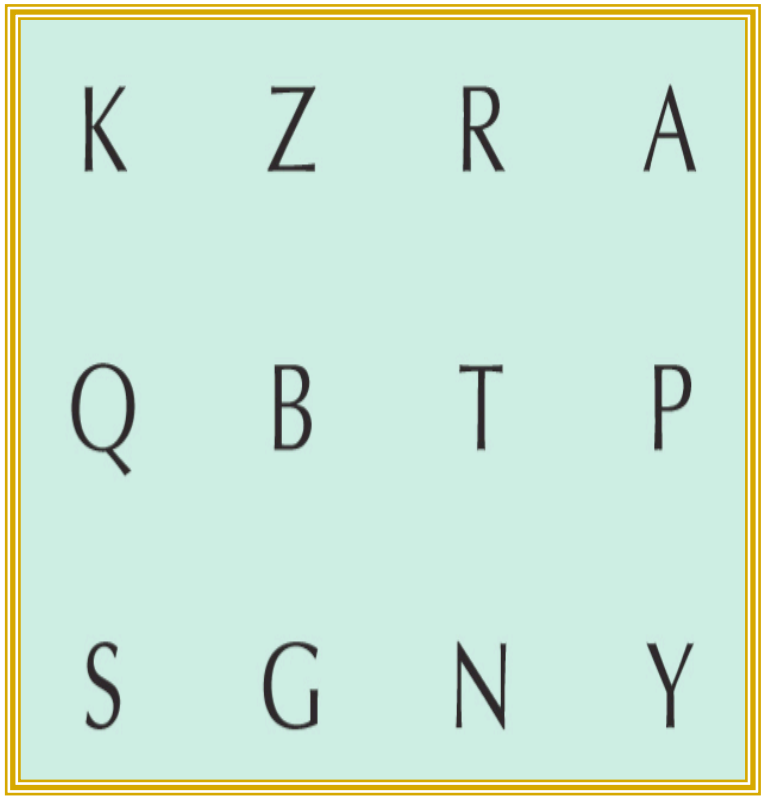
Diagram of Three-Stage Memory Model



The Nature of Memory—Description of Three Stage Memory Model

- **Sensory Memory:** briefly preserves a relatively exact replica of sensory information.
  - Sensory memory has a large capacity but information only lasts a few seconds.
  - Selected information is sent on to short-term memory.

Sperling's Experiment (1960) with Sensory Memory



- When flashed an arrangement of 12 letters for 1/20 of a second, most people can only recall 4 or 5. But Sperling proved all 12 letters were available in sensory memory if they can be attended to quickly.

The Nature of Memory— Three Stage Memory Model (Cont.)

- Short-Term Memory (STM): temporarily stores sensory information and decides whether to send it on to long-term memory (LTM).
- STM can hold 5-9 items for about 30 seconds before they are forgotten.
- STM capacity can be increased with chunking and duration improves with maintenance rehearsal.

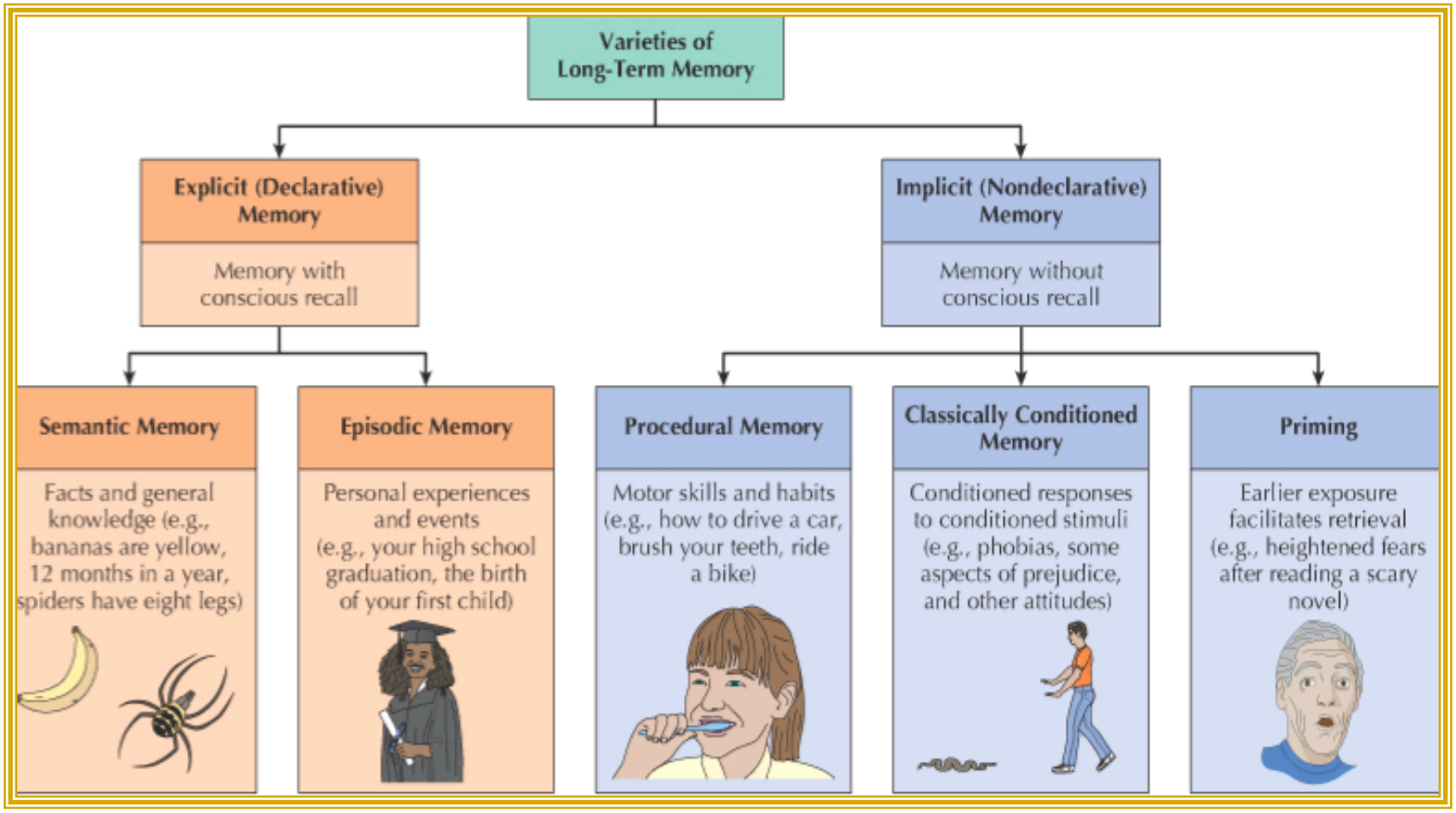
STM Cont'd

- Working memory: What you are doing with info while it is in STM.
  - Active processing

The Nature of Memory—Three Stage Memory Model (Continued)

- Long-term memory (LTM): relatively permanent memory storage with a virtually limitless capacity.

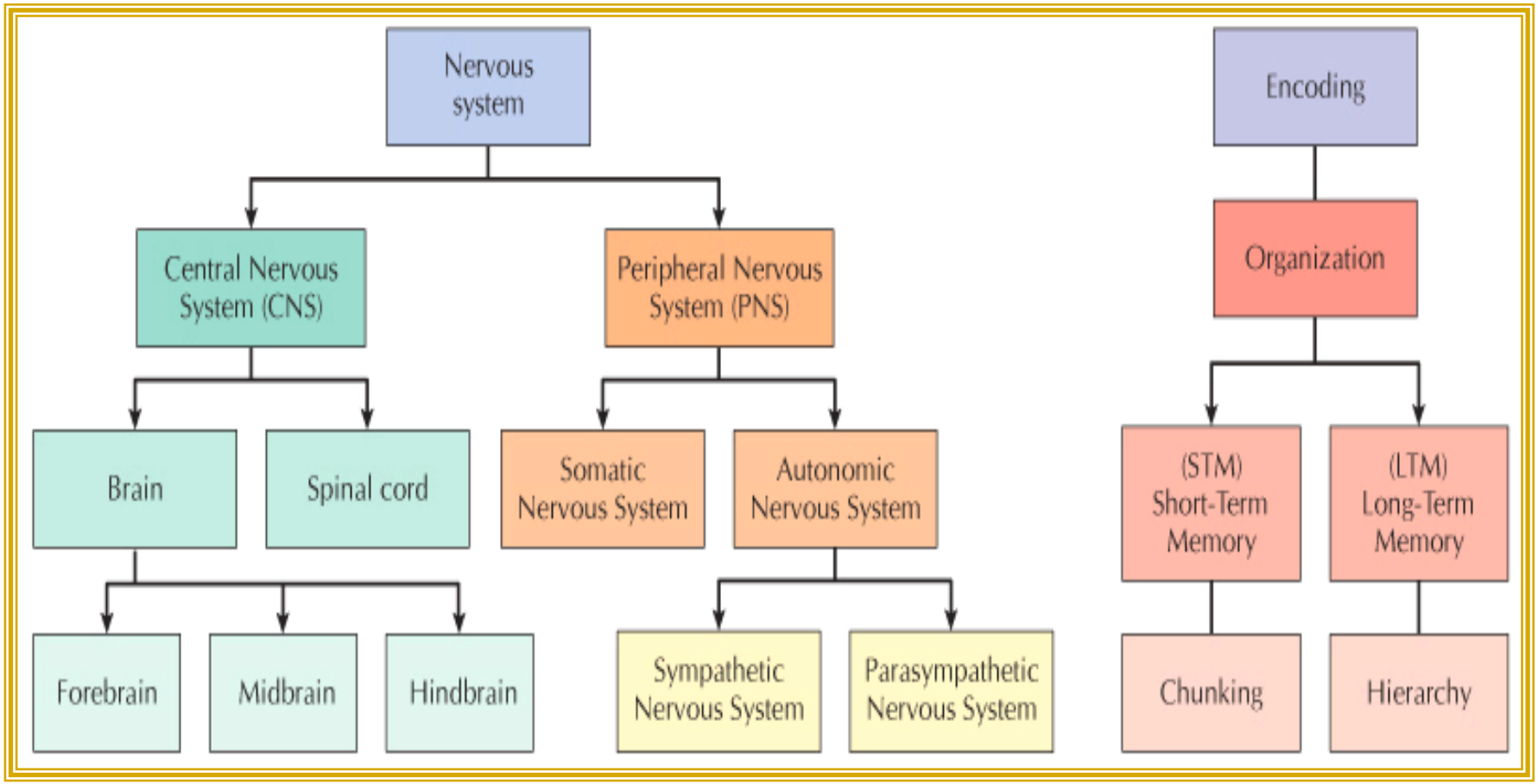
Types of Long-Term Memories



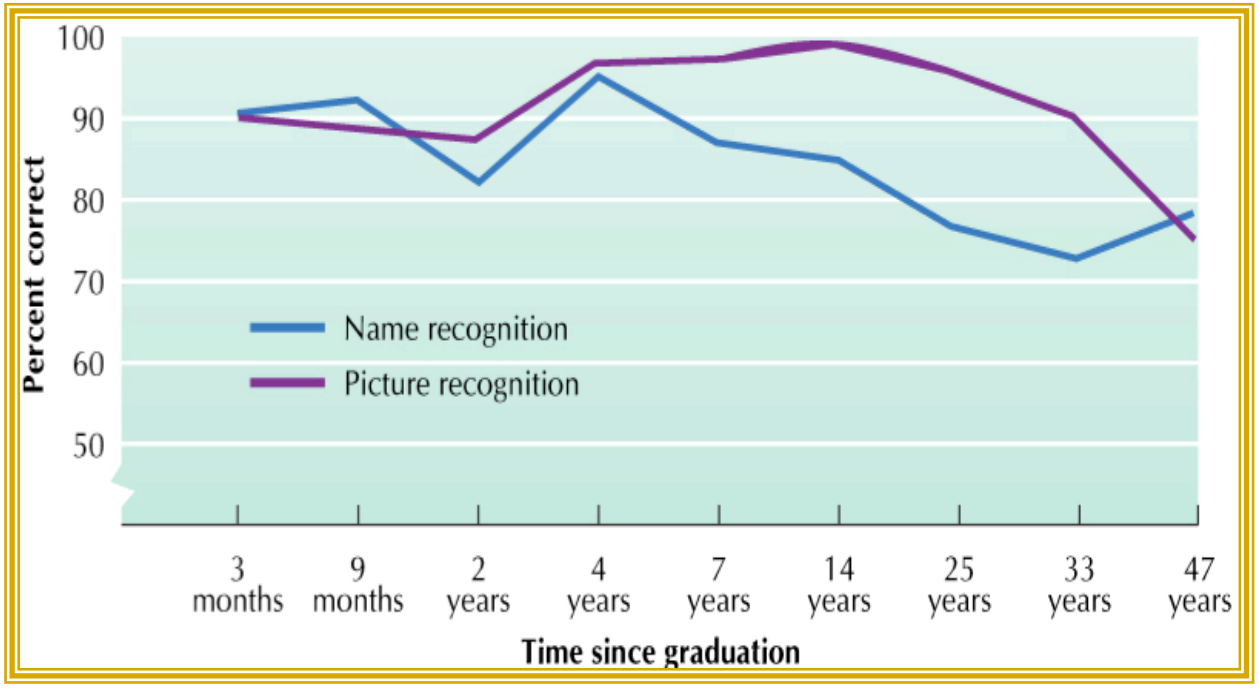
Improving Long-Term Memory (LTM)

- LTM can be improved with:
  - Organization
  - Elaborative rehearsal
  - Retrieval cues
    - Recognition
    - Recall

An Example of Using Hierarchies as an Organizational Tool



An Example of Recognition Vs. Recall



- Research shows that people are much better at recognizing the photos of previous high school classmates than they are at recalling their names.

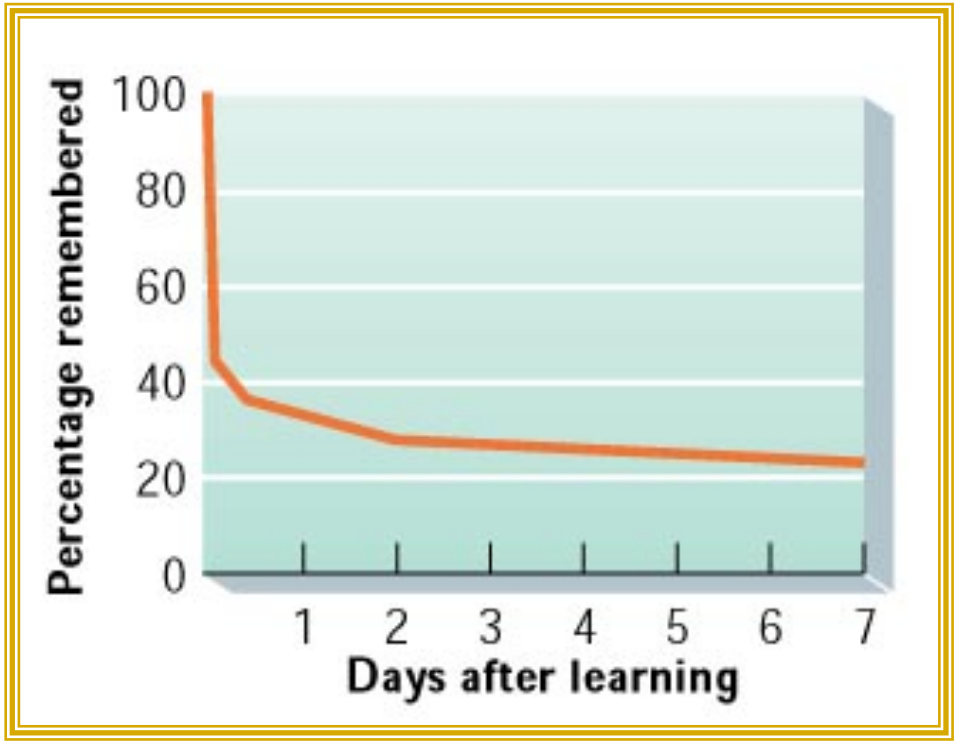
A Test for Recall: Can You Write Down the Names of Santa's Nine Reindeer?

Now Try *Recognizing* the Names (Need Help? Answers Appear in Appendix B)

- A) Rudolph
- B) Dancer
- C) Cupid
- D) Lancer
- E) Comet
- F) Vixen
- G) Blitzen
- H) Crasher
- I) Donner
- J) Prancer
- K) Sunder
- L) Thunder
- M) Dasher
- N) Donder

Forgetting

- Ebbinghaus found:
  - forgetting occurs most rapidly immediately after learning.
  - relearning takes less time than initial learning.



Why Do We Forget? Five Key Theories

- Decay
- Interference
- Motivated Forgetting
- Encoding Failure
- Retrieval Failure

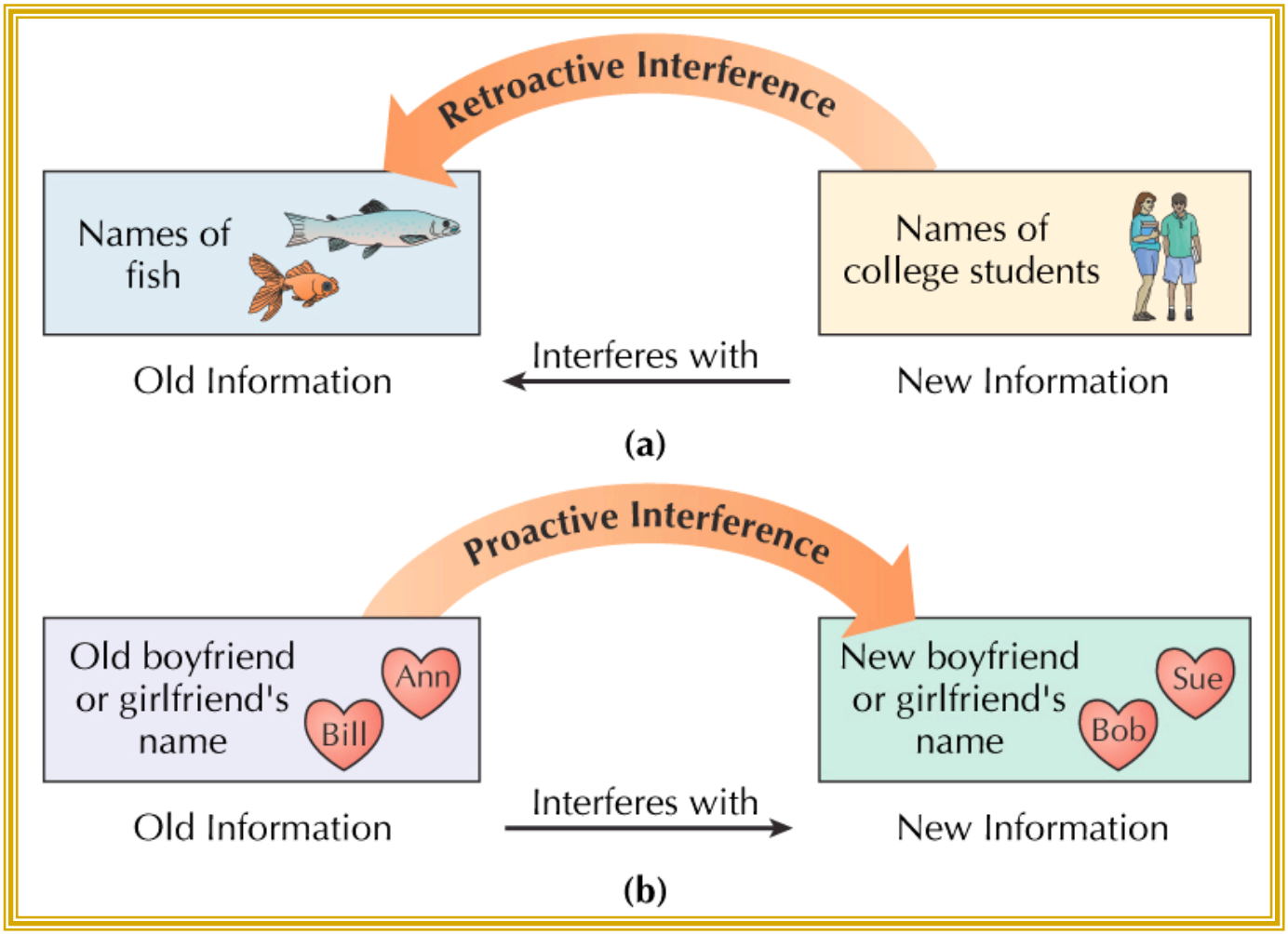
Five Theories of Forgetting (Continued)

1. Decay Theory:

   memory degrades with time

2. Interference Theory: one memory competes (or *interferes*) with another
   - Retroactive interference (new information *interferes* with old)
   - Proactive interference (old information *interferes* with new)

Two Forms of Interference



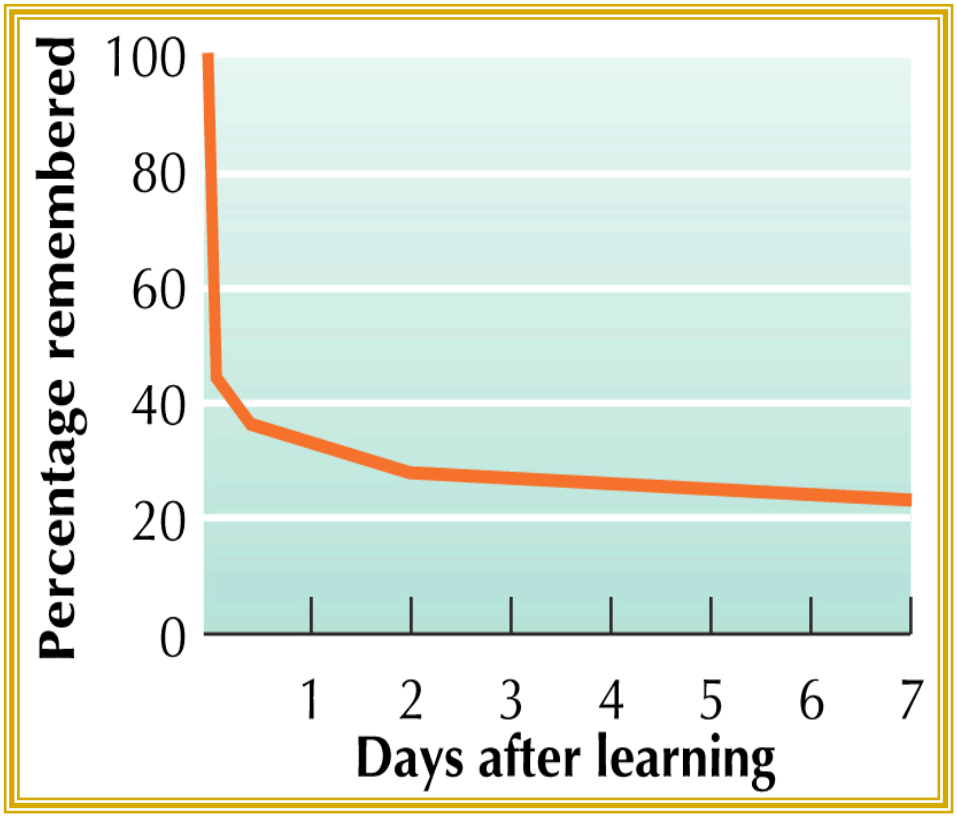
Five Theories of Forgetting (Continued)

3. Motivated Forgetting: we are *motivated* to forget unpleasant, painful, threatening, or embarrassing memories.
4. Encoding Failure: information in STM is not *encoded* in LTM.
5. Retrieval Failure: memories stored in LTM are momentarily inaccessible (tip-of-the-tongue phenomenon).

A Test for Encoding: Which of These is an Exact Duplicate of a Real Penny?

Overcoming Problems with Forgetting

- Serial Position Effect: material at the beginning and end of the list is remembered better than material in the middle.



Overcoming Problems with Forgetting (Continued)

- Source Amnesia: forgetting the true source of a memory
- Sleeper Effect: information from an unreliable source, which was initially discounted, later gains credibility because source is forgotten
- Spacing of Practice: distributed practice is found to be superior to massed practice

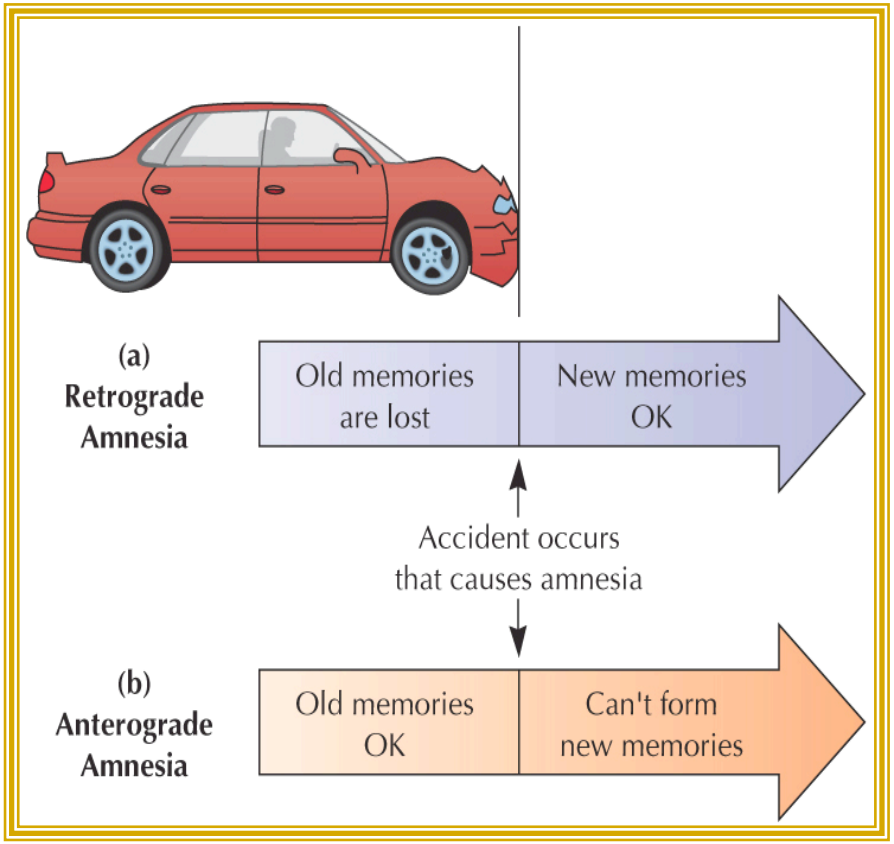
Biological Bases of Memory

- Hormones

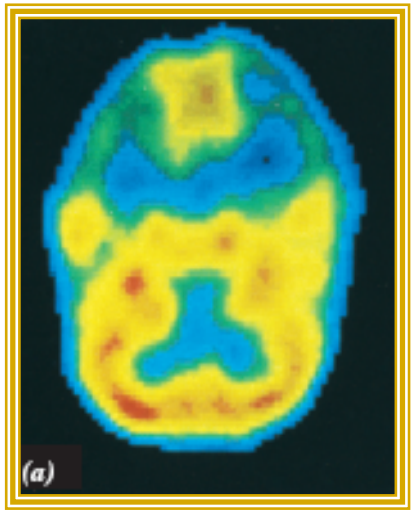
  also affect memory (e.g., flashbulb memories--vivid and lasting images are associated with surprising or strongly emotional events).

Biology and Memory Loss: Injury and Disease

- Amnesia: (memory loss from brain injury or trauma)
- Retrograde amnesia (old memories lost)
- Anterograde amnesia (new memories lost)



Biology and Memory Loss: Injury and Disease (Continued)



- Alzheimer's Disease (AD) (progressive mental deterioration characterized by severe memory loss)

Memory and the Criminal Justice System

- Two memory problems with profound legal implications:

- Eyewitness Testimony-- very persuasive but can be flawed.

- Repressed Memories— considerable debate as to whether recovered memories are accurate or repressed.

Using Psychology to Improve Our Memory

- Why do we distort our memories?
  - We need to maintain logic and consistency.
  - We also shape and construct our memories because it is more efficient to do so.

Using Psychology to Improve Our Memory (Continued)

- Eight Tips for Memory Improvement:

1. Pay attention and reduce interference.
2. Use rehearsal techniques.
3. Improve your organization.
4. Counteract the serial position effect.
5. Manage your time.

Using Psychology to Improve Our Memory (Continued)

6. Use the encoding specificity principle.
7. Employ self-monitoring and overlearning.
8. Use mnemonic devices (e.g., method of loci, peg-word, substitute word, word associations).