1 ☐ # Chapter 7: Memory: Remembrance of Things Past – and Future

2 ☐ **Truth or Fiction?**

- ❑A woman who could not remember who she was automatically dialed her mother's number when the police gave her a telephone.
- ❑Oh say, can you see? If the answer is yes, you have a photographic memory.

3 ☐ **Truth or Fiction?**

- ❑Learning must be meaningful if we are to remember it.
- ❑It may be easier for you to recall the name of your first-grade teacher than the name of someone you just met at a party.

4 ☐ **Truth or Fiction?**

- ❑All of our experiences are permanently imprinted on the brain, so the proper stimulus can cause us to remember them exactly.
- ❑You may always recall where you were and what you were doing on the morning of September 11, 2001.

5 ☐ **Truth or Fiction?**

- ❑If you study with the stereo on, you would probably do better to take the test with the stereo on.
- ❑Learning Spanish can make it harder to remember French – and vice versa.

6 ☐ **Truth or Fiction?**

- ❑After part of his hippocampus was surgically removed, a man could not form new memories. Each time he was reminded of his uncle's dying, he grieved as he had when he first heard of it.
- ❑You may improve your memory by sniffing a hormone.

7 ☐ **Preview of Chapter Seven**

- Memory Systems
- Processes of Memory
- Stages of Memory
- Forgetting
- The Biology of Memory

8 ☐ ## Memory Systems: Pressing the "Rewind" and "Fast-Forward" Buttons

9 ☐ **Explicit Versus Implicit Memories**

- Explicit memory – declarative memory
  - – Memory for specific information; that can be stated or declared
  - – Information can be autobiographical or general
- Implicit memory – nondeclarative memory
  - – Memory of how to perform a procedure or skill

10 ☐ **Episodic and Semantic Memory**

- Episodic memory – autobiographical memory
  - – Memories of things that happen to us or take place in our presence
  - – Explicit memories
- Semantic memory
  - – General knowledge

11 ☐ **Implicit Memory**

- Implicit memory
  - Suggested but not plainly stated or verbally expressed
- Procedural memory – Skill memory
  - Things people do, not things stated clearly
  - Things done repeatedly - habits

12 **Priming**

- Memory of things that reflect repetition that makes associations automatic
  - Memory of the alphabet or multiplication tables
  - Requires less neural activity

13 **Retrospective Memory Versus Prospective Memory**

- Retrospective memory
  - Recalling information previously learned
    - Episodic, semantic and implicit memories
- Prospective memory
  - Remembering things to do in the future

14 **Prospective Memory**

- Prospective memory tasks
  - Habitual tasks
    - Easier to remember than occasional tasks
  - Event-based tasks
    - Triggered by events
  - Time-based tasks
    - Performed at a certain time or after a certain time has elapsed

15 **Influences on Retrospective and Prospective Memory**

- Age related decline
  - More related to speed of cognitive processing than loss of information
- Moods and attitudes and prospective memory
  - Depressed people less likely to push to remind themselves to do what they intend to do

16 ## Processes of Memory: Processing Information in Our Most Personal Computers

17 **Information Processing: Encoding**

- Transforming information into psychological formulas that can be represented mentally
  - Visual – represented as a picture
  - Auditory – represented as sounds
  - Semantic – represented in terms of meanings

18 **Information Processing: Storage**

- Maintaining information over time
- Methods of storing information
  - Maintenance rehearsal
  - Elaborative rehearsal

19 **Information Processing: Retrieval**

- Locating information and returning it to consciousness
- Retrieval relies on cues

20 **What is Memory?**

- Memory is the process by which information is encoded, stored, and retrieved

21 ## Stages of Memory: Making *Sense* of the *Short* and the *Long of It*

22 **Atkinson-Shiffrin Model of Memory**

- Three stages of memory
  - Sensory memory
  - Short-term memory (STM)
  - Long-term memory (LTM)
- Information progress through these three stages determines whether and how long it is stored

23 **Three Stages of Memory**

24 **Sensory Memory**

- First stage of memory encountered by a stimulus
- Holds impressions briefly, but long enough so series of perceptions become psychologically continuous
  - Memory trace
    - Decays within a second
  - Sensory register

25 **Iconic Memory**

- Sensory register that holds icons
  - Icons are the mental representations of visual stimuli
- Brief, but accurate, photographic memories
  - Photographic or Eidetic imagery
    - mental representations of visual stimuli over long periods of time
- Iconic memory is common, eidetic memory is not

26 **Echoic Memory**

- Sensory register that holds echoes
  - Echoes are the mental representations of sounds
- Memory traces of echoes last longer than icons

27 **Short-Term Memory**

- Focusing on a stimulus in the sensory register, maintains it in short-term memory (STM) for a minute or so after the trace decays
  - Also called working memory
- Rehearsal allows information to be retained indefinitely

28 **Serial Position Effect**

- Tendency to recall the first and last items in a series
  - May be more attention to first and last items
  - May rehearse first item more often and last most recently

29 **Chunking**

- A grouping of stimuli that is perceived as a discrete piece of information
- Number of items held in STM –
  - Seven (plus or minus two)
  - Chunking stimuli allows for semantic coding

30

31 **Interference in Short-Term Memory**

- Attention to distracting information interferes with STM
- Appearance of new information in STM *displaces* old information

32 **The Effect of Interference on Short-Term Memory**

33 **Long-Term Memory**

- Long-term memories are reconstructed
  - – Schemas bias our memories
- No known limit known for amount of information stored in long-term memory (LTM)
- Long-term memories may last a life-time
  - – Not lost by displacement

34 **Video Connections: Reconstructive Memory**

- What kinds of factors influence a person's memory? How could these factor's affect eyewitness testimony?
- What is a "leading" question? Why does it "lead"?

35 **Memory as Reconstructive**

36 **Transferring Information from Short-Term Memory to Long-Term Memory**

- Maintenance Rehearsal
  - – Repeating information over and over
- Elaborative Rehearsal
  - – Relating new material to well-known material

37 **Levels of Processing Model of Memory**

- Memories endure when processed deeply
  - – Attention, encoding, storing, retrieval all involved

38 **Flashblub Memories**

- Tend to remember events that are important and emotionally stirring
  - – Memories are more distinctive
  - – Increased networks of association
  - – Elaborative rehearsal

39 **Organization in Long-Term Memory**

- Categorization of information
  - – Hierarchical structure
    - Superordinate classes of information

40 **Tip of the Tongue Phenomenon**

- "Feeling of knowing"
  - – Acoustic and semantic coding may help provide a useful retrieval cue
  - – May reflect incomplete learning

41 **Context and State Dependent Memory**

- Context dependent
  - – Déjà vu experience
- State dependent
  - – Biological or emotional state

42 **Forgetting:**
Will You Remember
How We Forget?

43 **How do We Measure Forgetting?**

- Nonsense syllables
  - – Depend on acoustic coding and maintenance rehearsal
- Three tasks for measurement
  - – Recognition
  - – Recall
  - – Relearning
    - Method of Savings

44 **Ebbinghaus's Classic Curve of Forgetting**

45 **Interference Theory**

- Retroactive interference
  - – New learning interferes with the retrieval of old learning
- Proactive interference
  - – Older learning interferes with the capacity to retrieve more recently learned material

46 **Repression**

- Freudian concept of motivated forgetting
  - – Automatic ejection of painful memories from conscious awareness
  - – Dissociative amnesia

47 **Recovered Memories**

- Recovery of repressed memories has little scientific support
- Implanting false memories

48 **Infantile Amnesia**

- Freud – repression
- Immature hippocampus
- Cognitive explanations
  - – No interest in remembering the past
  - – Specific episodes versus networks of memories
  - – Unreliable use of symbolic language

49 **Anterograde and Retrograde Amnesia**

50 **The Hippocampus**

51 **The Biology of Memory: The Brain as a Living Time Machine**

52 **Neural Activity and Memory**

- Experience increases dendrites and synapses in cerebral cortex
- Long-term potentiation
  - – Following brief, rapid stimulation an enhanced efficiency in synaptic transmission
- Neurotransmitters and hormones

53 **One Avenue to Long-Term Potentiation (LTP)**

54 **Brain Structures and Memory**

- Hippocampus
  - – new memories; episodic memories
- Cortex areas
  - – Store sensory information
- Prefrontal cortex
  - – Ability to represent and be aware of past, present and future events
- Thalamus
  - – Formation of verbal memories