

Chapter Seven

HUMAN MEMORY

Review of Key Ideas

ENCODING: GETTING INFORMATION INTO MEMORY

1. Describe the three basic human memory processes.

1-1. The three basic human memory processes are:

- (a) Putting the information in, a process called _____.
- (b) Holding onto the information, a process called _____.
- (c) Getting the information back out, a process called _____.

Answers: 1-1. (a) encoding (b) storage (c) retrieval.

2. Discuss the role of attention in memory.

- 2-1. If you are being introduced to a new person and you want to remember her name, it is first necessary to give selective _____ to this information. This requires _____ out irrelevant sensory input. The debate between early and late selection theories of attention is an argument over when this filtering takes place, before or after _____ is given to the arriving material.
- 2-2. Although there is ample evidence to support both early- and late-selection theories of attention, what conclusion have some been led to?
- 2-3. What effect does divided attention have on memory and many other tasks, such as using a cellular telephone while driving?

Answers: 2-1. attention, filtering, meaning 2-2. The location of the attention filter may be flexible rather than fixed.
2-3. It decreases performance.

3. Describe the three levels of information processing proposed by Craik and Lockhart and how processing relates to memory.

3-1. Craik and Lockhart proposed three levels for encoding incoming information, with ever increasing retention as the depth of processing increases. In their order of depth these three levels are:

(a) _____ (b) _____ (c) _____

3-2. Below are three-word sequences. Tell which level of processing each sequence illustrates and why.

(a) cat IN tree _____

(b) car BAR czar _____

(c) CAN CAP CAR _____

3-3. If this theory is correct then we would expect most persons to best remember the sequence in _____. This is because the words in this sequence have greater _____ than do the other two sequences. It has been found that processing time (is/is not) a reliable index of depth of processing, and thus what constitutes “levels” remains vague.

Answers: 3-1. (a) structural (b) phonemic (c) semantic 3-2. (a) Semantic because we immediately give meaning to the words. (b) Phonemic because the words sound alike. (c) Structural because the words look alike. 3-3. (a) cat in tree, meaning, is not.

4. Describe three techniques for enriching encoding and research on each.

4-1. Elaboration helps us to better remember the words RUN FAST CAT than the words WORK SLOW TREE. Why is this?

4-2. According to Paivio’s dual-coding theory, why is it easier to remember the word APPLE than the word PREVAIL?

4-3. What is the general idea behind self-referent encoding?

Answers: 4-1. Because the words RUN FAST CAT allow us to make richer and more elaborate associations among them than do the other three words (for example you can imagine a cat running fast). 4-2. Because it is easier to form a visual image of the word APPLE, thus allowing for storage of both the word and image. 4-3. We are more likely to remember information when it is relevant to ourselves.

STORAGE: MAINTAINING INFORMATION IN MEMORY

5. Describe the role of the sensory store in memory.

- 5-1. Sensory memory allows for retention of information for a very (brief/long) period of time. The retention time for sensory memory for both vision and audition is about _____. During this brief period the information (remains in/is changed from) its original sensory form.

Answers: 5-1. brief, 1/4 second, remains in.

6. Discuss the characteristics of short-term memory (STM).

- 6-1. Indicate whether the following statements regarding short-term memory are true or false.
- _____ (a) Has a virtually unlimited storage capacity.
 - _____ (b) Has a storage capacity of seven, plus or minus two, items.
 - _____ (c) Requires continuous rehearsal to maintain information in store for more than 20 or 30 seconds.
 - _____ (d) Stores information more or less permanently.
 - _____ (e) Chunking can help to increase the capacity of this system.

Answers: 6-1. (a) false (b) true (c) true (d) false (e) true.

7. Discuss Baddeley's model of working memory and related research.

- 7-1. Say which component of Baddeley's working memory + phonological rehearsal loop, visuospatial sketchpad, executive control system, or episodic buffer + is operating in the following situations.
- (a) You are mentally weighing the pros and cons of attending a particular university.
 - (b) You continue to recite a phone number as you walk towards the phone.
 - (c) You are describing the location of a restaurant to a friend.
 - (d) You are able to integrate information while performing the above tasks and interface it with long-term memory.
- 7-2. Research has shown that the separate modules (do/do not) work independently as hypothesized. Research has also shown that there are variations in people as to their ability to juggle information in their working memory. These variations correlate (positively/negatively) with measures of high-level cognitive abilities.

Answers: 7-1. (a) executive control system (b) phonological rehearsal loop (c) visuospatial sketchpad (d) episodic buffer. 7-2. do, positively.

8. Evaluate the hypothesis that all memories are stored permanently in long-term memory (LTM).

8-1. There are two views regarding the durability of information in LTM. One is that no information is ever lost, and the other is that _____ information is lost. Those who favor the permanent view explain forgetting as a failure of _____. The information is still there, we just cannot get it out.

8-2. How do those who doubt the permanency of long-term memory counter the following two lines of evidence cited by the permanent proponents?

(a) Flashbulb memories of previous events?

(b) Penfield's electrically triggered memories?

Answers: 8-1. some, retrieval 8-2. (a) They often tend to be inaccurate and less detailed with the passage of time. (b) The memories were often incorrect and resembled dreams or hallucinations more than real events.

9. Evaluate the issues in the debate about whether short-term and long-term memory are really separate.

9-1. The traditional view is that short-term memory differs from long-term memory in that it depends on phonemic (sound) encoding while long-term memory depends on _____ (meaning) encoding. These two systems are also said to differ in the manner in which forgetting occurs. The loss of memory in STM is thought to result from time-related decay, while LTM forgetting is attributed to _____.

9-2. What research findings undermine the traditional view?

9-3. Which view, multiple stores or a single system, dominates at the present time?

Answers: 9-1. semantic, interference 9-2. Semantic encoding and interference have also been found in short-term memory. 9-3. multiple stores.

10. Describe conceptual hierarchies, schemas, and semantic networks, and their role in long-term memory.

10-1. Group the following words into two groups or categories:

rose dog grass cat tree rat

You probably grouped the words into plants and animals, which is the general idea behind _____.

Thus, clustering leads to forming categories (concepts), and in turn the categories are organized into _____

_____ hierarchies. For example, the categories of plants and animals can be placed under the higher category (hierarchy) of _____ things.

10-2. It also appears that LTM stores information in clusters of knowledge about particular objects or events, called _____. For example, in the study cited by the text, the subjects who falsely recalled seeing books did so because of their schema of what a professor's _____ looks like. Although people are (more/less) likely to remember things consistent with their schemas, this is not always true, particularly with objects that contrast (dramatically/casually) with their schema-based expectations.

10-3. In addition to conceptual categories, it appears that LTM also stores information in terms of semantic networks. If you understand the idea behind semantic networks and its related idea of spreading activation, you should be able to answer the questions below.

Person A attends an urban university and frequently studies while riding a bus to and from school.

Person B attends a university located in a rural area and frequently studies outside in one of the many park-like areas surrounding the school.

- (a) When asked to think of words associated with the word STUDY, which of the students is most likely to think of the word GRASS? _____
- (b) Which person is most likely to think of the word TRAFFIC? _____
- (c) Which person is most likely to think of the word PEACEFUL? _____

Answers: 10-1. clustering, conceptual, living 10-2. schemas, office, more, dramatically 10-3. (a) person B (b) person A (c) person B.

11. Explain how parallel distributed processing (PDP) models view the representation of information in memory.

11-1. PDP models assume that a piece of knowledge is represented by a particular _____ of activation across an entire system of innerconnected neural networks. This approach is called “connectionism” because the information lies in the strengths of the _____.

11-2. The PDP approach has at least two strengths. First, it (agrees/disagrees) with the findings from neurophysiological research. Second, it can account for the (slow/blazing) speed of human's cognitive functioning.

Answers: 11-1. pattern, connections 11-2. agrees, blazing.

RETRIEVAL: GETTING INFORMATION BACK OUT OF MEMORY

12. Explain how retrieval cues and context cues influence retrieval.

12-1. In the following examples, indicate whether retrieval cues or context cues are being used to retrieve information from long-term memory.

- (a) In trying to recall the name of a high school classmate, you get the feeling that his first name began with an “L”, and begin saying names like Larry, Leroy, Lionel, etc.

- (b) Or you may attempt to recall the high school classmate by imagining the history class in which he sat in the row next to you.

Answers: 12-1. (a) retrieval cues (b) context cues.

13. Discuss Bartlett's work, the misinformation effect, and imagination inflation.

- 13-1. Bartlett's work with the "The War of the Ghosts", found that the subjects reconstructed the original tale to fit with their already established _____. Since we use schemas to move information in and out of long-term memory, it is not too surprising that these schemas may alter retrieved information.
- 13-2. For example, Elizabeth Loftus found that subjects who were originally asked, "How fast were the cars going when they (hit/smashed) into each other?" were much more likely to falsely recall having seen broken glass on a videotaped scene when tested at a later date. In this case the word "smashed" resulted in a different _____ than did the word "hit." The distortion of memory by the word "smashed" is an example of how post-event information can result in the _____ of an original memory.
- 13-3. Research has also shown that a few moments of imagination can significantly increase many subjects' belief that they actually had an experience similar to the imagined event. This effect is called _____.

Answers: 13-1. schemas 13-2. smashed, schema, reconstruction 13-3. imagination inflation.

14. Discuss the implications of evidence on source monitoring and reality monitoring.

- 14-1. A third explanation for distorted memory retrieval involves source monitoring. Both source monitoring and its subtype, reality monitoring, require us to make attributions about the _____ of memories. Errors in memory from both kinds of monitoring are (rare/common).
- 14-2. Say whether the situations below are examples of source monitoring (S) or reality monitoring (R).
- _____ (a) You become convinced that you broke your arm when you were five years old, but your mother tells you that it never happened.
- _____ (b) You attribute a funny story to your good friend Tom when in fact it was Fred, whom you don't really care for, who told you the story.
- _____ (c) You believe that you received an "A" in high school algebra, but your transcript shows a "C".

Answers: 14-1. origins, common 14-2. (a) R (b) S (c) R.

FORGETTING: WHEN MEMORY LAPSES

15. Describe Ebbinghaus's forgetting curve and three measures of retention.

- 15-1. Ebbinghaus's forgetting curve, using nonsense syllables and himself as the subject, showed that forgetting was most rapid in the (first/second) nine hours after learning the material. Later research has shown that the dramatic decline is (the same/much less) when more meaningful material is involved.

15-2. Which of the three different methods of measuring forgetting is illustrated in each of the following situations?

(a) You are asked to identify a suspect in a police lineup.

(b) You time yourself while learning 20 new French words. After a week you find you have forgotten some of the words, and you again time yourself while learning the list a second time.

(c) You are asked to draw a floor plan of your bedroom from memory.

Answers: 15-1. first, much less 15-2. (a) recognition (b) relearning (c) recall.

16. Explain how forgetting may be due to ineffective encoding.

16-1. Why are most people unable to recognize the correct penny shown at the beginning of this chapter in the text?

16-2. What is another name for information loss due to ineffective coding of this kind?

16-3. Why is semantic coding better than phonemic coding for enhancing future recall of written material?

Answers: 16-1. They never encoded the correct figure in their memories. 16-2. pseudoforgetting 16-3. Semantic coding will lead to deeper processing and more elaborate associations.

17. Compare and contrast decay and interference as potential causes of forgetting.

17-1. Two other theories of forgetting propose additional factors that may be involved in retrieval failure. One theory holds that retrieval failure may be due to the impermanence of the memory storage itself. This is the notion behind the _____ theory of forgetting. Decay theory is best able to explain retrieval failure in _____ memory and to a lesser extent in (short-term/long-term) memory.

17-2. The other theory attributes retrieval failure to other information already in the memory or to information arriving at a later time. This is the notion behind the _____ theory of forgetting. According to interference theory, the failure may be caused by interference from information already in the memory, a phenomenon called _____ interference, or the failure may be caused by interference occurring after the original memory was stored, a phenomenon called _____ interference. Interference is most likely to occur when the materials being stored are very (similar/different).

Answers: 17-1. decay, sensory store, short-term 17-2. interference, proactive, retroactive, similar.

18. Explain how forgetting may be due to factors in the retrieval process.

- 18-1.** Breakdowns in the retrieval process can occur when the encoding specificity principle is violated. This means there has been a mismatch between the original memory code and the _____ cue being used to retrieve the information. A common instance of this violation is seen when one attempts to retrieve a semantically coded word with (semantic/phonemic) retrieval cues.
- 18-2.** Retrieval failure may also occur when there is a poor fit between initial encoding processing and the processing required by the measure of retention. In other words, the two kinds of processing are not transfer-_____.
- 18-3.** Sigmund Freud felt that some breakdowns in the retrieval process could be attributed to purposeful suppression of information by unconscious forces, a phenomenon called _____ forgetting. Freud called motivated forgetting _____.

Answers: 18-1. retrieval, phonemic 18-2. appropriate 18-3. motivated, repression.

19. Summarize evidence for the view that most recovered memories of childhood sexual abuse are genuine.

- 19-1.** Those who argue that most of these recovered memories are genuine assert that the frequency of sexual abuse in childhood is (less/more) widespread than most people realize.
- 19-2.** What did the 17-year follow-up study find regarding 129 female children who had emergency treatment for sexual abuse?

Answers: 19-1. more 19-2. 38 percent failed to report the original incident.

20. Summarize evidence for the view that most recovered memories of childhood sexual abuse are inaccurate.

- 20-1.** How do the skeptics of these recovered memories of childhood sexual abuse explain their origin?
- 20-2.** What is the only way to tell for certain if a recovered memory is genuine or a pseudomemory?

Answers: 20-1. Some suggestible people are convinced by persuasive therapists (that these events must have happened). 20-2. through independent corroborative evidence.

IN SEARCH OF THE MEMORY TRACE: THE PHYSIOLOGY OF MEMORY

21. Summarize evidence on the biochemistry and neural circuitry underlying memory.

21-1. Which of the following biochemical changes have been implicated in the physiology of memory?

- (a) alterations in synaptic transmission at specific sites
- (b) induced changes in RNA
- (c) hormones that can either facilitate or impair memory storage
- (d) interference with protein synthesis

21-2. Answer the following questions regarding the neural circuitry of memory.

- (a) What caused a rabbit to lose its memory of a conditioned eye blink?

- (b) What neural changes were found in rats that learned to run a series of mazes?

- (c) What does research with long-term potentiation (LTP) and the demonstration of an increase in neuronal dendritic trees tell us about how memory is stored?

Answers: 21-1. a, c, d 21-2. (a) Destruction of an area in the cerebellum. (b) Increased growth of neuronal dendritic trees. (c) Specific memories may have specific localized dedicated neural circuits.

22. Distinguish between two types of amnesia and identify the anatomical structures implicated in memory.

22-1. Amnesia cases due to head injury provide clues about the anatomical basis of memory. There are two basic types of head-injury amnesia. When the memory loss is for events prior to the injury, it is called _____ amnesia. When the memory loss is for events following the injury, it is called _____ amnesia.

22-2. What general region of the brain appears to play a major role in the consolidation of memories?

22-3. Consolidation is an hypothesized process which involves the gradual conversion of information into durable memory _____ stored in long-term memory. These memories are consolidated in the hippocampal region and then stored in the (hippocampus/all over the cortex).

22-4. Parallel distributed processing models of memory suggest that the hippocampal area serves to _____ together individual elements of a specific memory which are then stored in various areas of the cortex.

Answers: 22-1. retrograde, anterograde 22-2. the entire hippocampal region 22-3. codes, all over the cortex 22-4. bind.

ARE THERE MULTIPLE MEMORY SYSTEMS?

23. Distinguish between declarative and nondeclarative (procedural) memory.

- 23-1. Label the two following situations as to whether they are examples of declarative or nondeclarative memory.
- (a) This system allows you to drive a car or play a piano with minimal attention to the execution of movements that are required.
 - (b) This system allows you to explain how to drive a car or play a piano to a friend.

Answers: 23-1. (a) nondeclarative (b) declarative.

24. Explain the distinctions between episodic memory versus semantic memory and prospective versus retrospective memory.

- 24-1. It has also been hypothesized that declarative memory can be further subdivided into semantic and episodic memory. Identify these two kinds of memory from the following descriptions:
- (a) This kind of memory acts like an encyclopedia, storing all of the factual information you possess.
 - (b) This kind of memory acts like an autobiography, storing all of your personal experiences.
- 24-2. Still another possibility is that we have separate memory systems for prospective and retrospective memory. The distinction here is between our ability to remember events from the past or previously learned information, _____ memory, and our ability to remember or perform actions in the future, _____ memory.
- 24-3. Which form of prospective memory appears to give us the most trouble when we try and retrieve it, memory of event-based tasks or memory of time-based tasks?

Answers: 24-1. (a) semantic (b) episodic 24-2. retrospective, prospective 24-3. time-based tasks.

REFLECTIONS ON THE CHAPTER'S THEMES

25. Explain how this chapter highlighted three of the text's unifying themes.

- 25-1. Three unifying themes were especially noteworthy in this chapter: the subjectivity of experience, psychology's theoretical diversity, and multifactorial causation. The text mentions two areas in which subjectivity may influence memory. Identify them below.
- (a) We often see only that which gets the focus of our _____.
 - (b) Every time we tell about a particular experience, details are added or subtracted because of the _____ nature of memory.

- 25-2. The numerous debates about the nature of memory storage, the causes of forgetting, and the existence of multiple memory systems nicely illustrate psychology's _____.
- 25-3. Since the memory of a specific event can be influenced by many factors, operating in each of the three memory stores, it is obvious that memory, like most behavior, has _____.

Answers: 25-1. (a) attention (b) reconstructive 25-2. theoretical diversity 25-3. multifactorial causation.

APPLICATION: IMPROVING EVERYDAY MEMORY

26. Discuss the importance of rehearsal, distributed practice, and interference in efforts to improve everyday memory.

- 26-1. The text lists three general strategies for improving everyday memory. Identify which strategy is being employed in the following examples.
- (a) Most persons can remember their phone number because of extensive _____.
- (b) Willie Nurd, the bookworm, always takes breaks between study periods when changing subject matter. Willie must realize the importance of _____ practice.
- (c) Ajax never studies any other material besides mathematics on the day of his math exams in order to minimize _____.
- 26-2. The serial position effect means that words in the middle of a list will need (more/less) of our attention.

Answers: 26-1. (a) rehearsal (b) distributed (c) interference 26-2. more.

27. Discuss the value of deep processing and good organization in efforts to improve everyday memory.

- 27-1. Answering questions such as these is much better than simply underlining the same material in the text because it forces you to engage in _____.
- 27-2. Outlining material from textbooks can enhance retention because it leads to better _____ of the material.

Answers: 27-1. deep processing 27-2. organization.

28. Describe some verbal and visual mnemonic devices that can be used to improve everyday memory.

- 28-1. Specific strategies for enhancing memory are called _____ devices. Examples of strategies which do not employ visual images are listed below. See if you can identify which strategy is being employed in each illustration.
- (a) Using the phrase, "My Very Excellent Mother Just Sells Nuts Under Protest", to remember the names and positions of the planets illustrates the use of an _____.

- (b) International Business Machines is easily identified by its _____, IBM.
- (c) The phrase, "One two three four, I left my keys in the drawer," illustrates the use of _____.
- (d) Since you are going to the store, your roommate asks you to bring her a bar of Ivory soap, a box of Kleenex, and a Snickers bar. You then make up a story which begins, "On my way to the Ivory Coast to check on the latest shipment of Kleenex, I" Here you're making use of a _____ method as a mnemonic device.

28-2. Three techniques involving visual imagery can also serve as helpful mnemonic devices: the link method, the method of loci, and the keyword method. Identify them in the examples below.

- (a) You want to remember the name of your bus driver, Ray Blocker, who has especially large forearms. You form an image of a man using his large arms to block light rays from his face.
- (b) You want to remember to buy bananas, eggs, milk, and bread. You visualize walking in your front door and tripping on a bunch of bananas. Stumbling forward into the hallway you notice broken eggs on the table, etc.
- (c) You imagine yourself using a banana to break eggs, which you then pour into a bowl of milk and bread.

Answers: 28-1. mnemonic (a) acrostic (b) acronym (c) rhyming (d) narrative 28-2. (a) keyword method (b) method of loci (c) link method.

CRITICAL THINKING APPLICATION

29. Explain how hindsight bias and overconfidence, contribute to the frequent inaccuracy of eye-witness testimony.

- 29-1.** The frequent inaccuracy of eye-witness testimony is due in part to the reconstructive nature of memory, source monitoring, and the misinformation effect. In addition, the text points out that still another factor is our tendency to mold our interpretation of the past to fit how events actually turned out. This is called _____.
- 29-2.** The failure to seek disconfirming evidence can often lead to the _____ effect, which is still another reason for the frequent inaccuracy of eye-witness testimony.

Answers: 29-1. hindsight bias 29-2. overconfidence.

Review of Key Terms

Anterograde amnesia
Attention
Chunk
Conceptual hierarchy
Connectionist models
Consolidation

Decay theory
Declarative memory system
Dual-coding theory
Elaboration
Encoding
Encoding specificity principle

Episodic memory system
Flashbulb memories
Forgetting curve
Hindsight bias
Interference theory
Levels of processing theory

Link method
 Long-term memory (LTM)
 Long-term potentiation (LTP)
 Method of loci
 Misinformation effect
 Mnemonic devices
 Nondeclarative memory system
 Overlearning
 Parallel distributed processing (PDP)
 models
 Proactive interference
 Prospective memory

Reality monitoring
 Recall
 Recognition
 Rehearsal
 Relearning
 Repression
 Retention
 Retrieval
 Retroactive interference
 Retrograde amnesia
 Retrospective memory
 Schema

Self-referent encoding
 Semantic memory system
 Semantic networks
 Sensory memory
 Serial-position effect
 Short-term memory
 Source-monitoring
 Source-monitoring error
 Storage
 Tip-of-the-tongue phenomenon
 Transfer-appropriate processing

- _____ 1. Putting coded information into memory.
- _____ 2. Maintaining coded information in memory.
- _____ 3. Recovering information from memory stores.
- _____ 4. The process of focusing awareness on a narrowed range of stimuli or events.
- _____ 5. Involves remembering to perform actions in the future.
- _____ 6. Involves remembering events from the past or previously learned information.
- _____ 7. The initial processing of information is similar to the type of processing required by the subsequent measure of retention.
- _____ 8. Assumes that cognitive processes depend on patterns of activation in highly interconnected computational networks that resemble neural networks.
- _____ 9. Occurs when participants' recall of an event they witnesses is altered by introducing postevent information.
- _____ 10. A theory that proposes that deeper levels of processing result in longer lasting memory codes.
- _____ 11. Involves linking a stimulus to other information at the time of encoding.
- _____ 12. A theory that memory is enhanced by forming both semantic and visual codes since either can lead to recall.
- _____ 13. Preserves information in the original sensory form for a very brief time.
- _____ 14. A limited capacity memory store that can maintain unrehearsed information for 20 to 30 seconds.
- _____ 15. The process of repetitively verbalizing or thinking about new information.
- _____ 16. A group of familiar stimuli stored as a single unit.
- _____ 17. An unlimited capacity memory store that can hold information over lengthy periods of time.
- _____ 18. Unusually vivid and detailed recollections of momentous events.
- _____ 19. Occurs when subjects show better recall of items at the beginning and end of a list than for items in the middle.
- _____ 20. Memory for factual information.
- _____ 21. Strategies for enhancing memory.
- _____ 22. Memory made up of chronological, or temporally dated, recollections of personal experiences.
- _____ 23. Memory that contains general knowledge that is not tied to the time when the information was learned.

- _____ 24. These consist of concepts joined together by links that show how the concepts are related.
- _____ 25. A long lasting increase in neural excitability at synapses along a specific neural pathway.
- _____ 26. An organized cluster of knowledge about a particular object or sequence of events.
- _____ 27. The attempt to mold our interpretation of the past to fit how it actually turned out.
- _____ 28. A temporary inability to remember something you know accompanied by the feeling that it's just out of reach.
- _____ 29. A curve graphing retention and forgetting over time
- _____ 30. The proportion of material remembered.
- _____ 31. The ability to remember information without any cues.
- _____ 32. Requires the selection of previously learned information from an array of options (e.g., multiple-choice tests).
- _____ 33. Requires the memorization of information a second time to determine how much time or effort is saved.
- _____ 34. Attributes forgetting to the impermanence of memory storage.
- _____ 35. Attributes forgetting to competition from other material.
- _____ 36. Occurs when new information impairs the retention of previously learned information.
- _____ 37. Occurs when previously learned information impairs the retention of new information.
- _____ 38. States that the value of a retrieval cue depends on how well it corresponds to the memory code.
- _____ 39. Involves purposeful suppression of memories (motivated forgetting).
- _____ 40. A theoretical process involving the gradual conversion of information into durable memory codes stored in long-term memory.
- _____ 41. The loss of memory for events that occurred prior to a brain injury.
- _____ 42. The loss of memory for events that occur after a brain injury.
- _____ 43. Strategies for enhancing memory.
- _____ 44. The continued rehearsal of material after it has apparently been mastered.
- _____ 45. Involves forming a mental image of items to be remembered in a way that connects them together.
- _____ 46. A mnemonic device that involves taking an imaginary walk along a familiar path.
- _____ 47. A multi-level classification system based on common properties among items (e.g., cats, animals, living things).
- _____ 48. The process of deciding how or whether information is personally relevant.
- _____ 49. The process of making attributions about the origins of memories.
- _____ 50. The process of deciding whether memories are based on external or internal sources.
- _____ 51. An error that occurs when a memory derived from one source is attributed to another.
- _____ 52. Another term for the procedural memory system which houses memory for actions, skills, and operations.

Answers: 1. encoding 2. storage 3. retrieval 4. attention 5. prospective memory 6. retrospective memory 7. transfer-appropriate processing 8. connectionists models and parallel distributed processing (PDP) 9. misinformation effect 10. levels of processing theory 11. elaboration 12. dual-coding theory 13. sensory memory 14. short-term memory (STM) 15. rehearsal 16. chunk 17. long-term memory (LTM) 18. flashbulb memories 19. serial position effect 20. declarative memory system 21. mnemonic devices 22. episodic memory system 23. semantic memory system 24. semantic networks 25. long-term potentiation 26. schema 27. script 28. tip-of-the-tongue phenomenon 29. forgetting curve 30. retention 31. recall 32. recognition 33. relearning 34. decay theory 35. interference theory 36. retroactive interference 37. proactive interference 38. encoding specificity principle 39. repression 40. consolidation 41. retrograde amnesia 42. anterograde amnesia 43. mnemonic devices 44. overlearning 45. link method 46. method of loci 47. conceptual hierarchy 48. self-referral encoding 49. source monitoring 50. reality monitoring 51. source-monitoring error 52. nondeclarative memory.

Review of Key People

Alan Baddeley
 Sir Fredrick Bartlett
 Fergus Craik and Robert Lockhart
 Herman Ebbinghaus

Eric Kandel
 Marcia Johnson
 Elizabeth Loftus
 George Miller

Brenda Milner
 Richard Thompson
 Endel Tulving

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|--|---|
| | 1. Proposed three progressively deeper levels for processing incoming information. |
| | 2. Proposed the concept of a working memory that underlies human thought processes. |
| | 3. She, and her colleagues, proposed the notions of source and reality monitoring. |
| | 4. Demonstrated that the reconstructive nature of memory can distort eyewitness testimony. |
| | 5. Used nonsense syllables to become famous for his forgetting curve. |
| | 6. One of his many contributions was the encoding specificity principle. |
| | 7. Proposed the concept of chunking for storing information in short-term memory. |
| | 8. Followed the case of HM, who had his hippocampus removed. |
| | 9. Experimentally demonstrated the reconstructive nature of memory. |
| | 10. Showed reflex learning in the sea slug produces changes in the strength of specific synaptic connections. |
| | 11. Showed that specific memories may depend on localized neural circuits in the brain. |

Answers: 1. Craik & Lockhart 2. Baddeley 3. Johnson 4. Loftus 5. Ebbinghaus 6. Tulving 7. Miller 8. Milner 9. Bartlett 10. Kandel 11. Thompson.

Self-Quiz

1. Which of the following is not one of the three basic human memory processes?
 - a. storage
 - b. retrieval
 - c. decoding
 - d. encoding

2. Which one of the three levels of processing would probably be employed when attempting to memorize the following three-letter sequences: WAB WAC WAD?
 - a. structural
 - b. semantic
 - c. phonemic
 - d. chunking

3. According to Paivio's dual-coding theory:
 - a. words are easier to encode than images
 - b. abstract words are easier to encode than concrete words
 - c. visual imagery may hinder the retrieval of words
 - d. it should be easier to remember the word banana than the word justice

4. Retrieval from long-term memory is usually best when the information has been stored at which level of processing?
 - a. structural
 - b. semantic
 - c. phonemic
 - d. chunking

5. Which of the memory stores can hold the least amount of information?
 - a. sensory store
 - b. short-term memory
 - c. long-term memory
 - d. declarative memory

6. Which of the following sequences of words would be most subject to a clustering effect?
 - a. FAN HEAVEN JUSTICE CHAIR
 - b. HOUSE VACATION MOUSE STATISTIC
 - c. BLUE DOG CAMEL YELLOW
 - d. CONVERSE ICICLE CONCEPT THINKING

7. Which word best describes the speed of human cognitive functioning?
 - a. slow
 - b. moderate
 - c. rapid
 - d. blazing

8. When you attempt to recall the name of a high school classmate by imagining yourself back in the English class with her, you are making use of:
 - a. retrieval cues
 - b. context cues
 - c. schemas
 - d. recognition cues

9. You recall being lost in a shopping mall at the age of five but your parents assure you that it never happened. Errors like this are most likely due to:
 - a. ineffective encoding
 - b. a reality monitoring error
 - c. a source monitoring error
 - d. the misinformation effect

10. Taking this particular self-test measures your:
 - a. constructive errors
 - b. reconstructive errors
 - c. recall
 - d. recognition

11. Ineffective encoding of information may result in:
 - a. the primacy effect
 - b. the recency effect
 - c. pseudoforgetting
 - d. chunking

12. Decay theory is best able to explain the loss of memory in:
 - a. sensory store
 - b. long-term memory
 - c. short-term memory
 - d. repressed memory

13. When you violate the encoding specificity principle, you are likely to experience an inability to:
 - a. encode information
 - b. store information
 - c. retrieve information
 - d. form a visual image of the material you want to retrieve

14. Which of the following statements is the most accurate evaluation as to the authenticity of the recall of repressed memories?
 - a. Research confirms that they are authentic.
 - b. Research confirms that they are not authentic.
 - c. Research cannot confirm or deny their authenticity.
 - d. I have no idea what you're talking about.

15. It is very easy to recall the name of your high school because it has been subjected to extensive:
 - a. deep processing
 - b. clustering
 - c. chunking
 - d. rehearsal

16. The failure to seek out disconfirming evidence can often lead to:
 - a. the overconfidence effect
 - b. the reconstructive bias
 - c. the hindsight bias
 - d. a source monitoring error

Answers: 1. c 2. a 3. d 4. b 5. b 6. c 7. d 8. b 9. b 10. d 11. c 12. a 13. c 14. c 15. d 16. a.

InfoTrac Keywords

Amnesia

Flashbulb Memories

Misinformation Effect

