Key Terms

absentmindedness lapses in memory that are caused by breaks in attention or our focus being somewhere else

acoustic encoding input of sounds, words, and music

amnesia loss of long-term memory that occurs as the result of disease, physical trauma, or psychological trauma

anterograde amnesia loss of memory for events that occur after the brain trauma

arousal theory strong emotions trigger the formation of strong memories and weaker emotional experiences form weaker memories

Atkinson-Shiffrin model (A-S) memory model that states we process information through three systems: sensory memory, short-term memory, and long-term memory

automatic processing encoding of informational details like time, space, frequency, and the meaning of words

bias how feelings and view of the world distort memory of past events

blocking memory error in which you cannot access stored information

chunking organizing information into manageable bits or chunks

construction formulation of new memories

declarative memory type of long-term memory of facts and events we personally experience

effortful processing encoding of information that takes effort and attention

elaborative rehearsal thinking about the meaning of the new information and its relation to knowledge already stored in your memory

encoding input of information into the memory system

engram physical trace of memory

episodic memory type of declarative memory that contains information about events we have personally experienced, also known as autobiographical memory

equipotentiality hypothesis some parts of the brain can take over for damaged parts in forming and storing memories

explicit memory memories we consciously try to remember and recall

false memory syndrome recall of false autobiographical memories

flashbulb memory exceptionally clear recollection of an important event

forgetting loss of information from long-term memory

implicit memory memories that are not part of our consciousness

levels of processing information that is thought of more deeply becomes more meaningful and thus better committed to memory

long-term memory (LTM) continuous storage of information

memory system or process that stores what we learn for future use

memory consolidation active rehearsal to move information from short-term memory into long-term memory

memory-enhancing strategy technique to help make sure information goes from short-term memory to long-term memory

misattribution memory error in which you confuse the source of your information

misinformation effect paradigm after exposure to incorrect information, a person may misremember the original event

mnemonic device memory aids that help organize information for encoding

persistence failure of the memory system that involves the involuntary recall of unwanted memories, particularly unpleasant ones

proactive interference old information hinders the recall of newly learned information

procedural memory type of long-term memory for making skilled actions, such as how to brush your teeth, how to drive a car, and how to swim

recall accessing information without cues

recognition identifying previously learned information after encountering it again, usually in response to a cue

reconstruction process of bringing up old memories that might be distorted by new information

rehearsal conscious repetition of information to be remembered

relearning learning information that was previously learned

retrieval act of getting information out of long-term memory storage and back into conscious awareness

retroactive interference information learned more recently hinders the recall of older information

retrograde amnesia loss of memory for events that occurred prior to brain trauma

self-reference effect tendency for an individual to have better memory for information that relates to oneself in comparison to material that has less personal relevance

semantic encoding input of words and their meaning

semantic memory type of declarative memory about words, concepts, and language-based knowledge and facts

sensory memory storage of brief sensory events, such as sights, sounds, and tastes

short-term memory (STM) (also, working memory) holds about seven bits of information before it is forgotten or stored, as well as information that has been retrieved and is being used

storage creation of a permanent record of information

suggestibility effects of misinformation from external sources that leads to the creation of false memories

transience memory error in which unused memories fade with the passage of time

visual encoding input of images

Summary

8.1 How Memory Functions

Memory is a system or process that stores what we learn for future use.

Our memory has three basic functions: encoding, storing, and retrieving information. Encoding is the act of getting information into our memory system through automatic or effortful processing. Storage is retention of the information, and retrieval is the act of getting information out of storage and into conscious awareness through recall, recognition, and relearning. The idea that information is processed through three memory systems is called the Atkinson-Shiffrin (A-S) model of memory. First, environmental stimuli enter our sensory memory for a period of less than a second to a few seconds. Those stimuli that we notice and pay attention to then move into short-term memory (also called working memory). According to the A-S model, if we rehearse this information, then it moves into long-term memory for permanent storage. Other models like that of Baddeley and Hitch suggest there is more of a feedback loop between short-term memory and long-term memory. Long-term memory has a practically limitless storage capacity and is divided into implicit and explicit memory. Finally, retrieval is the act of getting memories out of storage and back into conscious awareness. This is done through recall, recognition, and relearning.

8.2 Parts of the Brain Involved with Memory

Beginning with Karl Lashley, researchers and psychologists have been searching for the engram, which is the physical trace of memory. Lashley did not find the engram, but he did suggest that memories are distributed throughout the entire brain rather than stored in one specific area. Now we know that three brain areas do play significant roles in the processing and storage of different types of memories: cerebellum, hippocampus, and amygdala. The cerebellum's job is to process procedural memories; the hippocampus is where new memories are encoded; the amygdala helps determine what memories to store, and it plays a part in determining where the memories are stored based on whether we have a strong or weak emotional response to the event. Strong emotional experiences can trigger the release of neurotransmitters, as well as hormones, which strengthen memory, so that memory for an emotional event is usually stronger than memory for a non-emotional event. This is shown by what is known as the flashbulb memory phenomenon: our ability to remember significant life events. However, our memory for life events (autobiographical memory) is not always accurate.

8.3 Problems with Memory

All of us at times have felt dismayed, frustrated, and even embarrassed when our memories have failed us. Our memory is flexible and prone to many errors, which is why eyewitness testimony has been found to be largely unreliable. There are several reasons why forgetting occurs. In cases of brain trauma or disease, forgetting may be due to amnesia. Another reason we forget is due to encoding failure. We can't remember something if we never stored it in our memory in the first place. Schacter presents seven memory errors that also contribute to forgetting. Sometimes, information is actually stored in our memory, but we cannot access it due to interference. Proactive interference happens when old information hinders the recall of newly learned information. Retroactive interference happens when information learned more recently hinders the recall of older information.

8.4 Ways to Enhance Memory

There are many ways to combat the inevitable failures of our memory system. Some common strategies that can be used in everyday situations include mnemonic devices, rehearsal, self-referencing, and adequate sleep. These same strategies also can help you to study more effectively.

Review Questions

1. _____ is another name for short-term memory.
a. sensory memory
b. episodic memory
c. working memory
d. implicit memory

2. The storage capacity of long-term memory is _____.
a. one or two bits of information
b. seven bits, plus or minus two
c. limited
d. essentially limitless

3. The three functions of memory are _____.
a. automatic processing, effortful processing, and storage
b. encoding, processing, and storage
c. automatic processing, effortful processing, and retrieval
d. encoding, storage, and retrieval

4. This physical trace of memory is known as the _____.
a. engram
b. Lashley effect
c. Deese-Roediger-McDermott Paradigm
d. flashbulb memory effect

5. An exceptionally clear recollection of an important event is a (an) _____.
a. engram
b. arousal theory
c. flashbulb memory
d. equipotentiality hypothesis

6. _____ is when our recollections of the past are done in a self-enhancing manner.
a. stereotypical bias
b. egocentric bias
c. hindsight bias
d. enhancement bias

7. Tip-of-the-tongue phenomenon is also known as _____.
a. persistence
b. misattribution
c. transience
d. blocking

8. The formulation of new memories is sometimes called _____, and the process of bringing up old memories is called _____.
a. construction; reconstruction
b. reconstruction; construction
c. production; reproduction
d. reproduction; production

9. When you are learning how to play the piano, the statement "Every good boy does fine" can help you remember the notes E, G, B, D, and F for the lines of the treble clef. This is an example of a (an) _____.
a. jingle
b. acronym
c. acrostic
d. acoustic

10. According to a study by Yogo and Fujihara (2008), if you want to improve your short-term memory, you should spend time writing about _____.
a. your best possible future self
b. a traumatic life experience
c. a trivial topic
d. your grocery list

11. The self-referencing effect refers to _____.
a. making the material you are trying to memorize personally meaningful to you
b. making a phrase of all the first letters of the words you are trying to memorize
c. making a word formed by the first letter of each of the words you are trying to memorize
d. saying words you want to remember out loud to yourself

12. Memory aids that help organize information for encoding are _____.
a. mnemonic devices
b. memory-enhancing strategies
c. elaborative rehearsal
d. effortful processing