

# 4.

## MEMORY

### Exercise 1

Read the text and do the exercise that follows.

In psychology, memory is a cognitive system that **encodes**, **stores** and **retrieves** information. In crude terms, encoding is breaking meaningless sensory information (e.g. sound, image, taste) into meaningful patterns that can be stored and used later. Storage refers to the retention of encoded memory over time and retrieval to recovering stored memories.

Scientists came to believe that there is no single brain structure crucial to memory. Instead, different structures are associated with memory, including the cerebral cortex, the hippocampus, amygdala, cerebellum and basal ganglia.

The **prefrontal cortex** (part of the brain's frontal lobe) is responsible for short-term memory.

The **hippocampus**, called 'the seat of memory', is considered essential for the consolidation of short-term memories into long-term ones, and for spatial memory processing. For the memory to be consolidated, it must pass through the hippocampus several times. Once it is consolidated, it is stored in the **cerebral cortex**.

The brain seems to process and store various kinds of information in different ways. For instance, declarative memory is believed to be processed in the hippocampus and the surrounding areas, whilst procedural memory in the **basal ganglia**, particularly in **striatum**, and the **cerebellum**. Declarative memory for emotional content is strongly related to the **amygdala**.

There are basically three types of memory: **sensory memory**, **short-term**

**memory** and **long-term memory**. Sensory memory is the shortest-term memory. It allows you to remember sensory information (e.g. visual or auditory) but only up to a few seconds. The sensory memory for visual information is called **iconic memory**, and that for auditory information is called **echoic memory**. Then there is short-term memory. Short-term memory is the storehouse of temporary information that is retained for about 30 seconds unless it's rehearsed. Its capacity is typically  $7 \pm 2$  items. Finally, there is long-term memory, which is believed to be of indefinite capacity. It holds everything we know and remember such as skills, experiences, faces, events, songs and TV programmes. Long-term memory is divided into two subtypes: **explicit (declarative)** and **implicit (procedural)** memory. Explicit memory is the one that needs conscious and effortful recall of information. So, if you have named the capital of Slovakia or recalled the name of your high-school maths teacher, you have just made the use of your explicit memory. Implicit memory doesn't need a conscious thought though. It is the type of memory that allows you to button up your shirt or climb the stairs without thinking about it. Explicit memory can be further broken down into **episodic** and **semantic** memory. Episodic memory, as the name suggests, refers to the memory of autobiographical events such as personal experiences, emotions, places and times. In contrast, semantic memory is not related to any personal memories or experiences. It's generic memory of facts, ideas and concepts. Episodic memory which is emotionally charged is called **flashbulb memory**. This type of memory is a particularly vivid recollection of a meaningful and emotional event (such as a graduation, a wedding or a birth of a child) that will last a lifetime. Although people have great confidence in flashbulb memories, they are not always accurate in every respect. In fact, evidence suggests that flashbulb memories are no more reliable than ordinary memories.

### Choose the correct answer.

1. Information fades most quickly from \_\_\_\_\_ memory.
  - a) sensory
  - b) short-term
  - c) long-term
  - d) episodic

2. To ensure that new information is consolidated, one needs \_\_\_\_\_.
- a) retrieval
  - b) storage
  - c) rehearsal
  - d) encoding
3. In class a teacher asks you to name the three longest rivers in the world. You answer correctly because the names of the rivers are stored in your \_\_\_\_\_ memory.
- a) long-term
  - b) explicit
  - c) semantic
  - d) all of the above
4. Although you are not paying close attention to what your friend is saying, you are able to recall the last few words of his utterance. It is because the brain holds the exact copy of these words in \_\_\_\_\_ memory.
- a) episodic
  - b) echoic
  - c) iconic
  - d) semantic
5. I haven't been on a bicycle for a few years now, but after I hop back on I'm positive I'll remember how to ride. Knowing how to ride a bicycle is what's called \_\_\_\_\_ memory.
- a) declarative
  - b) semantic
  - c) episodic
  - d) procedural
6. At most, an average person is usually able to hold \_\_\_\_\_ items in his/her short-term memory.
- a) 4

- b) 7
  - c) 10
  - d) 15
7. Which of the following brain structures seems not to be associated with procedural memory?
- a) hippocampus
  - b) basal ganglia
  - c) striatum
  - d) cerebellum
8. Which of the following brain structures is crucial to emotional memories?
- a) cerebral cortex
  - b) cerebellum
  - c) amygdala
  - d) hippocampus
9. It takes you a long time to get to sleep because your mind keeps racing about the stressful events of the last few days, including a fight with your best friend. The kind of recollection that you engage in is called \_\_\_\_\_ memory.
- a) episodic
  - b) flashbulb
  - c) echoic
  - d) iconic
10. You vividly remember where you were and what you were doing when you heard the news of the presidential plane crash in Russia in 2010. Your memory of this dramatic event is what's known as \_\_\_\_\_ memory.
- a) echoic
  - b) sensory
  - c) flashbulb
  - d) semantic

11. You are driving along a mountainous road when a deer suddenly jumps out in front of the car and runs to the other side of the road. You see the animal for a very short time before it disappears into the thicket. The memory of the deer is briefly stored in your \_\_\_\_\_ memory.
- iconic
  - echoic
  - flashbulb
  - short-time

## Exercise 2

- a) Complete the table with the correct forms of the missing parts of speech.

Noun	Verb
retrieval	
	retain
storage	
conversion	
	recollect
recall	
	rehearse
consolidation	
revision	
	encode

**b) Complete the sentences below with the words from the table. Sometimes there is more than one answer.**

1. \_\_\_\_\_ in crude terms is a process of recovering information stored in memory.
2. It is not a secret that a good night's sleep helps us to \_\_\_\_\_ short-term memories into long-term ones.
3. Forgetting may occur through lack of \_\_\_\_\_ when information cannot be transferred from short-term memory into long-term memory.
4. Short-term memory has limited capacity and \_\_\_\_\_ only seven plus or minus two elements at a time.
5. Although \_\_\_\_\_ is a good way to strengthen memories, sometimes it's not enough to move the information into permanent memory.
6. Most events \_\_\_\_\_ in episodic memory fade away within a relatively short time unless they are of emotional significance.
7. Sometimes information becomes \_\_\_\_\_ into our memory without any particular effort.
8. In a history test a student uses explicit memory to \_\_\_\_\_ the date of an important battle.

### Exercise 3

Complete the following sentences with the verbs from the box in the right form.

commit, process, replay, boost, decay, discard, interfere

1. The brain \_\_\_\_\_ the information it receives in different brain structures and in different ways.

2. It is easier for young people to \_\_\_\_\_ things to memory than for elderly ones.
3. According to a study published in *Nature Neuroscience*, caffeine \_\_\_\_\_ memory for information learnt the previous day.
4. The brain \_\_\_\_\_ all the irrelevant and unwanted information to prevent information overload.
5. The sensory memory \_\_\_\_\_ within up to a few seconds, unless it is transferred to short-term memory.
6. When new information enters memory, it may \_\_\_\_\_ with the retention of previously learnt information.
7. The sleeping brain \_\_\_\_\_ the experiences of the day for consolidation.

## Exercise 4



For gaps 1–7 choose the answer (a, b or c) which you think fits best.

### Super Memory

Would you like to have a perfect memory and be able to \_\_\_\_\_ (1) reliably anything you want, anytime you want, without struggle? Think twice before you answer because while having an effortless access to memory can be a blessing, it can also be truly agonising.

What is it like to have perfect recall of every single day? Nadia, a fictitious character of a House episode called *You Must Remember This*, has a super memory. She is a waitress in a busy restaurant and one day, when a woman calls for her, she is able to \_\_\_\_\_ (2) with astonishing accuracy having served her before. She remembers everything of the encounter: how the woman looked that day, what she was wearing, what food she ordered. There are practically no gaps in her memory and it's killing her.

## Psychology Vocabulary in Use

Nadia may be a fictitious character, but her condition is very real. People with hyperthymesia, which is the technical name for superior autobiographical memory, are able to \_\_\_\_\_ (3) almost every day of their lives in vivid detail. Everything they see or hear is \_\_\_\_\_ (4) in their memories forever along with bad moments. Every bad word and thought, every failure, every missed opportunity and every moment of pain goes \_\_\_\_\_ (5). They are constantly haunted with fragments of memories. Sounds, images and scents are \_\_\_\_\_ (6) by external stimuli, but often they return by themselves.

Some people consider hyperthymesia a gift, but not all see it that way. Sometimes \_\_\_\_\_ (7) is a blessing.

- |                    |               |                |
|--------------------|---------------|----------------|
| 1. a) retrieve     | b) retain     | c) remind      |
| 2. a) retain       | b) retrieve   | c) recall      |
| 3. a) remind       | b) remember   | c) rehearse    |
| 4. a) remembered   | b) retained   | c) recollected |
| 5. a) unremembered | b) unrecalled | c) unforgotten |
| 6. a) triggered    | b) remembered | c) relieved    |
| 7. a) ignorance    | b) forgetting | c) repressing  |