Chapter 1 Memory

It just weighs about 3 pounds – about the same as 1½ bags of sugar. And holds about 100 billion nerve cells, and all your memories.

• How are those memories stored?
• What do the memories actually look like in the brain?
• Why do you think you remember some things and not others?
• Are memories accurate?
• If they are not accurate, what makes them lack accuracy?

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Processes of memory: Encoding, storage and retrieval

The memory palace

Encoding

Memory involves three processes: putting information into your brain (encoding), storing it there and retrieving it again. To begin we are going to focus on the encoding part.

Encoding means changing information so it can be stored in the brain. The form of the information is changed.

Visual encoding

Some memories are stored visually. For example, if you ask you to count the windows on your house you probably ‘see’ your house in your mind in order to count the windows. That information is visually encoded.

Acoustic encoding

Some memories are stored in terms of what they sound like. The most obvious example would be your favourite songs. If you think about them, you can hear the words and music.

Another example is learning the alphabet to the tune of Twinkle Twinkle Little Star – the rhyme is encoded acoustically.

Semantic encoding

‘Semantic’ refers to meaning. We all know thousands of words and your semantic memory is the meaning of these words – that is your ability to understand and use words and concepts.

For example, you know and understand the word elephant and you can use the word in a sentence.

Other encoding

Tactile encoding is a memory of what things feel like and olfactory memory is the meaning of these words – that is your ability to understand and use words and concepts.

For example, you know and understand the word elephant and you can use the word in a sentence.

Meaningful associations ...

All sorts of memory ‘tricks’ rely on making meaningful associations. For example:

ROY G. BIV helps me (Caris) remember the colours of the rainbow (Red stands for red, O for orange …)

Or you can use each letter to make up a rhyme:

Richard of York Gave Battle in Vain.

Both of these are well known mnemonic techniques – methods to improve your recall of lists of things.

Study tip

Don’t lose marks

Make sure you expand enough on your answers. When explaining key terms in Psychology (see question 3 below), it is always good practice to give a relevant example to illustrate your point as this further demonstrates your knowledge and understanding of a topic (A1).
What is meant by... 

Encoding

A process of memory: A study of encoding

Studying the marks

A study of encoding

A controlled experiment

Evaluation

A study of short-term memory

Baddley’s study: Aim

Method

Results

Conclusion

STM may sometimes be visual

Extra: Was it LTM?

Stretch and challenge

Apply it – research

Baddley (1966 a, b) conducted one of the best-known studies of encoding in memory. Psychologists distinguish between short-term memories (STM) and long-term memories (LTM) – sometimes we store information but only rather briefly; for example, if you are phoning someone you use their phone number while you are talking. But then the number is forgotten. This is an example of short-term memories. Long-term memories are those that last longer, in other words, you can retrieve them after hours, days or even years.

Baddley aimed to see if there was a difference in the type of encoding used in short- and long-term memory.

Method

There were four groups of participants: A, B, C, and D. Each group was given one of the lists on the left.

Group A heard 12 sets of five words from List A. For example, one set might be: cab, can, mad, man, mix. Another set might be: mat, map, cap, cab, cad. The words were read out at a rate of one per second.

After each set of five words the participants were asked to immediately recall the five words in the correct order. The participants had a card with all the ten words from the list, it was the order of recall that mattered.

Group B did the same with List B.

Group C did the same with List C except they waited 20 minutes before they recalled the words, and the same applied to Group D with List D.

Results

Baddley found that participants did worse with List A than List B. He also found that they did worse with List C than List D.

Conclusion

List A has acoustically similar words (they sound the same) whereas List B has acoustically dissimilar words (they don’t sound the same). The fact that participants did worse with List A than List B suggests that the next day, so recall after 20 minutes may not really be LTM. Therefore Baddeley may not have actually been testing LTM at all.

In the study LTM was tested by asking participants to verbally recall the composite word list. Two picture pairs were shown below.

1. Research into encoding could be said to lack validity because it is meant by a ‘lack of validity’. Briefly explain why validity might or might not be an issue in a study that investigated encoding. (3 marks) [2 marks]

2. Imagine that you have been asked to conduct a study to investigate encoding. Write a hypothesis for this research study. (3 marks) [2 marks]

3. Describe and evaluate one study that has investigated how memories are encoded. (4 marks) [3 marks]

4. What is meant by encoding? (2 marks)

5. What is meant by encoding? (2 marks)

6. What is meant by encoding? (2 marks)

7. What is meant by encoding? (2 marks)

8. What is meant by encoding? (2 marks)

9. What is meant by encoding? (2 marks)
What is meant by …
Episodic memory
Procedural memory

People with amnesia usually can remember how to do things, such as make scrambled eggs or ride a bicycle, but they lose almost all recollection of their past life. They remember how to speak but can’t remember facts about the world or personal events that happened to them.

In other words they appear to lose only certain kinds of memory.

One famous case was a gifted British musician, Clive Wearing. He developed an infection in his brain and within a day had lost almost all memory of his past. He can still play the piano brilliantly and conduct a choir but he can’t remember when he first learned about Justin Bieber, for example (if you do – then that memory is an episodic one).

1. Episodic memory

Episodic memory is your memory for events (episodes) from your life. It’s your memory for the things you have done and experiences you have had. For example, a visit to the dentist, a gig you went to last week, your birthday party when you were 10, and so on.

You recall the time and place of such episodes. You may also remember who else was there, what happened before and afterwards, and you may also remember what you felt about it. So these memories are ’time-stamped’.

2. Semantic memory

Semantic is about ‘meaning’. Your semantic memory is like your own encyclopedia. It is the meaning of everything you know – but specifically it is the knowledge that is shared with other people (whereas episodic memories may be unique to you). For example, Paris is the capital of France, or England won the World Cup in 1966 are both semantic memories.

Unlike episodic memories, semantic memories are not ’time-stamped’. We usually remember when we first learned about Justin Bieber, for example (if you do – then that memory is an episodic one).

3. Procedural memory

Procedural memory is ‘muscle memory’ – remembering how to do things. We can recall these memories without conscious awareness or a great deal of effort. A good example is driving a car. Our ability to do this invariably depends on procedural memory. We change gear without having to recall how.

We indicate left or right at a junction without even realising we’ve done so. These are the sorts of skills we might find quite hard to explain to someone else. If you try to describe what you are doing as you drive the car, the task may well become more difficult.

Declarative and non-declarative memories

You don’t have to make an effort to recover the procedural and non-declarative but they provide a good way of summarising the differences between the three types of long-term memory. Episodic/semantic memories are grouped together as declarative memories because they require conscious recall. Procedural memory doesn’t require conscious recall and so is classified as non-declarative.

This is what you have learned so far
Chapter 1 Memory

Structures of memory: The multi-store model

The specification says …

Structures of memory: The multi-store model of memory, sensory, short term and long term.

Features of each store: coding, capacity, duration.

The model

Richard Atkinson and Richard Shiffrin (1968) developed a model to explain how memory works. The model consisted of three kinds of memory and an explanation about how information moves from one store to the next.

**Coding**

- Sensory memory
- Short-term memory
- Long-term memory

**Digit span**

Here are 5 digits: 4 5 2 9 3

Close your eyes and try to repeat them in the same order. Easy.

Now try

6 digits: 2 6 1 8 3 4

7 digits: 8 6 9 2 5 4 1

8 digits: 5 3 7 8 6 2 7

9 digits: 3 6 2 5 9 7 1 8

Most people can remember between 5 and 9 items.

**Chunking**

You can increase your digit span by chunking, which is how we remember phone numbers. It is easier to remember 020 7329 6438 than 02073296438.

**What is meant by …**

Long-term memory (LTM) tends to be semantic rather than acoustic. The strength of this study is that it clearly shows that coding in STM is acoustic and in LTM it is semantic.

Further support is given by the study described on the next page on the word position effect.

**Sensory memory**

The beginning of any memory happens when information is received by one of the senses – hence ‘sensory memory’. When you look at an object, that visual image is remembered at least for a very short time. When you hear someone’s voice, their message can be heard for a very short time afterwards.

- **Coding**: Sensory memory is a storage place at the eyes or ears or fingertips or nose. These memories are encoded (or encoded) in a form appropriate to the sense – so memories at your eyes are encoded visually and memories at your ears are encoded acoustically.
- **Capacity**: All the information from your world passes through your five senses. For example, the retina in your eyes (which record visual input) contains millions of cells. Therefore, we say that sensory memory has a very high capacity.
- **Duration**: Information remains in your sensory memory only very briefly – less than half a second (for visual sensory memory – unless you pay attention to it). If you pay attention to the information from your sensory memory, this information is transferred to another area of your brain, which is referred to as your short-term memory.

**Short-term memory (STM)**

STM is known as a limited capacity store, because it can only contain a certain number of things at any one time. If you try to squeeze any more into it, it won’t work – old information is overwritten or pushed out. This is what happens when you try the digit span test on the left – there is only so much space to hold information (you can practise and increase it).

- **Coding**: Tends to be acoustic i.e. in terms of ‘sounds’.
- **Capacity**: is, on average, between 5 and 9 items or chunks of information.
- **Duration** is less than 30 seconds unless it is rehearsed. If you want to remember it for 30 minutes after 30 seconds you wouldn’t remember it unless you rehearsed it. If you repeat the digits verbally over and over they will stay in your STM.

**Role of rehearsal**

In fact, if you kept silently repeating – or rehearsing – the digits, they will go into your long-term memory and you will recall them tomorrow or even next week and possibly even next year if you rehearse them enough. This is called maintenance rehearsal.

**Long-term memory (LTM)**

- **Coding**: Tends to be semantic rather than acoustic.
- **Capacity**: is potentially unlimited because of the way our brains evolved – the brain is constantly needing us to use our LTMs.
- **Duration**: is, on average, between 5 and 9 items or chunks of information.

**What is meant by …**

**Evaluation**

**Supporting research**

**Point**: One strength is there is evidence for different memory stores.

**Explanation**: A major strength is that the model is supported by research studies that show that STM and LTM are indeed qualitatively different. For example, Baddeley (page 14) found that we tend to mix up words that sound similar when we are using our STM. But we mix up words that have similar meanings when we use our LTM. The strength of this study is that it clearly shows that coding in STM is acoustic and in LTM it is semantic. So they are different, and this supports the view that these two memory stores are separate and independent.

**The model is too simple**

**Point**: One weakness is that the model is too simple.

**Explanation**: The multi-store model suggests that we have just one STM and one LTM. However, research has shown that each of these stores has separate parts: STM is divided into separate visual and acoustic stores, and LTM is divided into episodic, semantic and procedural memory (as discussed on the previous spread). This suggests that our memory is far more complex than the multi-store model originally proposed.

**EXTRA: Artificial materials**

**Point**: Another weakness is that research studies in the 1950s and 1960s tended to use artificial memory tasks.

**Explanation**: The studies often required participants to recall word lists or nonsense syllables such as PRQ or SDF. This means that the results would not illustrate all the different ways we use memory but instead tended to focus on verbal learning.

Zachary’s phone number

Read the line below and then answer the question that follows.

Zachary has been given a phone number that he needs to remember but does not have anything to write it down with. He keeps repeating the number to himself over and over again until he finds a pen to make a note of it. The following day he finds to his surprise that he can still remember it.

1. Why he needed to repeat the number to himself whilst looking for a pen.
2. How he was able to remember the number the following day.
3. Why this game has been called pelmanism or concentration. It can be played with ordinary playing cards or a memory game of matching figures. All the cards are laid face down at the start of the game.

1. **What is the multi-store model of memory?**

   **Definition**: The multi-store model of memory is divided into three main stores: sensory memory, short-term memory, and long-term memory.

   **Explanation**: In the multi-store model, information is first stored in sensory memory, which has a very high capacity and only lasts for a very short time. If the information is rehearsed, it moves to short-term memory, which has a limited capacity and lasts for about 30 seconds. If the information is rehearsed again, it moves to long-term memory, which has an unlimited capacity and lasts indefinitely.

2. **What are the characteristics of sensory memory?**

   **Definition**: Sensory memory is the temporary storage of information from the sensory system, allowing for immediate recognition.

   **Characteristics**: Sensory memory has a very high capacity, lasts for a very short duration, and is processed using the five senses.

3. **What are the characteristics of short-term memory?**

   **Definition**: Short-term memory is the mental store where information is held for a short period of time, typically between 5 and 9 items, before it is transferred to long-term memory.

   **Characteristics**: Short-term memory has a limited capacity, lasts for a short duration, and information tends to be encoded in terms of sounds.

4. **What are the characteristics of long-term memory?**

   **Definition**: Long-term memory is the permanent storage of information in the brain, allowing for retrieval of information over a long period of time.

   **Characteristics**: Long-term memory has an unlimited capacity, lasts for a long duration, and information is encoded in a semantic manner.

5. **What is the significance of the study described in the text?**

   **Significance**: The study showed that people can remember numbers in STM if they rehearse them repeatedly, whereas in LTM they need to encode the numbers in a different way.

6. **What is the difference between sensory memory and short-term memory?**

   **Difference**: Sensory memory stores information for a short time, whereas short-term memory holds information for a longer period, typically up to 30 seconds.

7. **What is the difference between short-term memory and long-term memory?**

   **Difference**: Short-term memory has a limited capacity and lasts for a short duration, whereas long-term memory has an unlimited capacity and lasts indefinitely.

8. **What is the role of rehearsal in memory?**

   **Role of Rehearsal**: Rehearsal helps to transfer information from short-term memory to long-term memory by repeating the information repeatedly.

9. **What is the importance of encoding in memory?**

   **Importance of Encoding**: Encoding involves converting information into a form that can be remembered, making it easier to store and retrieve in memory.

10. **What are the limitations of the multi-store model?**

    **Limitations**: The multi-store model is too simple because it does not account for the complexity of human memory, which involves the interaction of different memory systems.

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Chapter 1 Memory

**Structures of memory: Primacy and recency effects in recall**

**Murdock’s serial position curve study**

Bennet B. Murdock Junior conducted a similar investigation to the one described on the left.

**Aim**

Murdock (1962) set out to see if memory for words was affected by the number of words a person had to remember.

**Method**

To create his word lists Murdock randomly selected words from the 4,000 most common words in English.

103 students on a Psychology course took part in the study and were tested in groups over a number of different sessions.

In each session, the participants listened to 20 word lists, each containing different words. The words lists varied in length from 10 words to 40 words.

After each list the participants had to recall the words they had just heard.

**Results**

Murdock Sound that the likelihood of recall was related to the position of the word in the list, as shown in the graph below for a 20-word list.

- A similar graph was produced no matter what the length of the list – in every case participants had:
  - Higher recall for the first few words on the list than those in the middle of the list. This is called a primacy effect.
  - Highest recall for the final few words on the list. This is called a recency effect.

**Conclusion**

These results demonstrate a serial position effect – the position of a word determines the likelihood of its recall. Recency effects are strongest.

The results support the multi-store model because they fit the predictions of the model. The first words are well remembered because they have been rehearsed longest and are therefore long-term memories. The more recent words are well remembered because they are still in the short-term memory store. So the study illustrates the action of short- and long-term memory as described by the multi-store model.

**Evaluation**

- **A controlled laboratory study**
  - **Point:** One strength is that this study was conducted in very controlled conditions which means we can trust the results.
  - **Explanation:** When we are studying cause and effect relationships it is important that we control everything carefully to isolate the variables we are interested in. In this study:
    - Independent variable (IV) was the position of a word in the list.
    - Dependent variable (DV) was the probability that the word was recalled.

- **Artificial task**
  - **Point:** One weakness is that, in this study, memory was investigated by using lists of words that only represent a small part of what we do with our memories.
  - **Explanation:** The problem is that this research only tells us about one aspect of memory – how we deal with memorising words. But we do a lot of other things with our memories such as remember how to play basketball or remember whether we like someone or not.

- **EXTRA: Supporting research**
  - **Point:** One strength of this study is research with amnesic supports the conclusions.
  - **Explanation:** Research has shown that people who have amnesia and can’t store long-term memories also do not show a primacy effect (Carlesimo et al. 1996). This confirms that the primacy effect is related to long-term memory.

**Apply it – concept**

**The Generation Game**

Read the item below and then answer the question that follows.

The Generation Game was an 80s TV show which featured a particularly novel way for contestants to win prizes. They had to watch a number of items go past them on a conveyor belt and had to remember as many of those items as they could – they were allowed to take home anything they remembered.

There were usually 20 items and each contestant saw each item for a few seconds before it disappeared out of their view. Contestants often remembered the first and last prizes that they saw. Refer to the primacy and recency effect in your answer.

**Question**

Explain why the contestants tended to remember the first and last prizes that they saw. Refer to the primacy and recency effect in your answer. [4 marks]
The study

Frederic Bartlett (1932) conducted a series of studies to show that memories are formed through reconstruction. His hypothesis was that if a person was given something to remember and then asked to recall the story or picture over a period of weeks or years, the reconstruction would be endlessly transformed (i.e., changed). In particular, if the information to be remembered is somewhat unfamiliar and/or unusual, people will impose their own familiar experiences and make the story more familiar over time. Such expectations are based on social and cultural knowledge.

Method

Bartlett used a technique he called serial reproductions. In the War of the Ghosts study, he showed participants the story on the left and asked them to reproduce it shortly after (e.g. 15 minutes later), then he showed them the new version to another person and asked them to recall it a short time later, and repeated this with further participants. A key feature of the story was that it belonged to a culture that was very different from that of the participants – Bartlett’s participants were people at university in the UK (students, friends and colleagues).

Bartlett kept a record of successive recall (a protocol). None of the participants knew the purpose of the study.

Results

Bartlett found that participants remembered different parts of the story and that they interpreted the story within their own frames of reference (social and cultural expectations), changing the facts to make them fit. You can see two examples of what people remembered on the facing page that show how the original story was transformed.

Bartlett made several observations about the transformations that occurred

• The story was shortened, mainly by omissions.
• The phrasal units were changed to language and concepts from the participants’ own culture. For example, using ‘boats’ instead of ‘canoe’.
• The recalled version soon became very fixed, though each time it was recalled there were slight variations.

Conclusions

All of these transformations had the effect of making the material easier to remember. We don’t remember details, we remember fragments and use our knowledge of social situations to reconstruct memory. Individuals remembered the meaning and tried to sketch out the story using invented details. This reconstructed version of events is simpler to remember and therefore becomes our story.

What is meant by …

Culture refers to the beliefs and expectations that surround us. We are not conscious of living in a culture, yet a fish would not be aware that it lives in water, yet it powerfully influences us.

What people remembered...

Reproduction 3

This is the story of two young Indians who lived at Egulac. One day they were engaged in seal-fishing, the day being calm but foggy. Suddenly through the fog was heard the sound of paddles, and soon five warriors emerged into view on the far side. The warriors were five men, armed with bows and arrows. The other one said, ‘I will come with you, for there is none to miss me’.

Then said one of the Indians, ‘I cannot come, for my parents, who had need of me, will be sore wounded’. But the Indian replied, ‘Nay, that cannot be, for I feel no pain’.

‘What do you think? We wish to take you along.’ ‘What do you think? We wish to take you along.’

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Stretch and challenge

Consider the protocols on the facing page (*a protocol* was the term Bartlett used for the record of the recall).

Identify some key differences between them and the original.

For example:

• Can you find examples of words that were changed?
• Can you find examples of where the meaning was kept the same but some elements were changed (lost the original)?
• Can you find examples where cultural elements were changed?

Evaluation

Lacks control

Point: One weakness is the study was conducted rather casually with no set standards about where and how people recalled the information.

Explanation: The participants were not given very specific instructions at the outset about what they should do. Another study found that recall was much more accurate when participants were told, from the beginning, that accurate recall was important (Gould and Stephenson 1967). However, participants did still make errors. This suggests that recall is probably more accurate than Bartlett suggested.

The results were biased

Point: Another weakness is that Bartlett’s own beliefs may have affected the way he interpreted the data.

Explanation: The conclusions depend on how you interpret the results. Bartlett analysed each example of recall and had to decide what constituted accurate recall and what didn’t. Since he believed that recall would be affected by cultural expectations, he may have been more likely to see this kind of effect in the results. This means that we cannot fully trust the results of his study.

EXTRA: The story was unusual

Point: One weakness is that the story was unusual and therefore may not reflect everyday memory processes.

Explanation: Most of the time we use memory to deal with ‘boring’ everyday events. In such cases our memories are not affected by cultural expectations and we therefore may recall things quite accurately.

Therefore, this study may tell us very little about everyday memory.

Sir Frederic Bartlett (1886–1969)

Bartlett is regarded as one of the ‘great’ psychologists. His main work was a book called Remembering. A Study in Experimental and Social Psychology (1932), which included his War of the Ghosts study. The book (and his studies) changed the view psychologists had of memory. His theory of reconstructive memory is discussed on the next spread.

Bartlett was also a pioneer in experimental psychology, setting up a lab at the University of Cambridge in 1912. He was knighted just after the Second World War because of his work with the Royal Air Force.

Apply it – research

Canton questions

A psychology student wanted to find out if memory is reconstructive. He recruited ten students who happened to be in the school canteen at the time. He presented them with an unusual story, and gave them two minutes to read it. He then took the story away and the participants had to write down their own version of it from what they could remember. The student then collected the participants’ responses.

Questions

1. Are the data collected in this study qualitative or quantitative? Give one reason for your answer.
2. Identify the sampling method used by the student.
3. Explain one weakness of this sampling method.
4. Identify an alternative sampling method the student could have used to overcome the weakness you identified in question 3 and give one reason for your choice.
5. Give one strength and one weakness of correlations.

Reproduction 7

Once upon a time two young Indians from Egulac were fishing for seals, when a cloud containing five warriors came down the river. The Indians were alarmed, and while they were still became foggy and calm. Then they heard war-cries, and they thought, ‘May this be a war-party’. They escaped to the shore and hid behind a big box. Now came up, and they heard the noise of paddles, and saw one canoe coming up to them. There were five men in the canoe, and they said:

‘What do you think? We wish to take you along.’

‘What do you think? We wish to take you along.’

‘What do you think? We wish to take you along.’

So one of the young men went, but the other returned home.

And the warriors went up the river on to a town on the other side of Kalama. The people came down to the water, and they began to fight, and many were killed. But presently the young man heard one of the warriors say: ‘Quick, let us go home: that Indian has escaped to the shore and hidden behind a log. Now, my friends, we are sure to be overthrown. But the other one said, ‘I will come with you, for there is none to miss me’.

Then said one of the Indians, ‘I cannot come, for my parents, who had need of me, will be sore wounded’. But the Indian replied, ‘Nay, that cannot be, for I feel no pain’.

‘What do you think? We wish to take you along.’ ‘What do you think? We wish to take you along.’

We are going up the river to make war on the warriors say: ‘Quick, let us go home: that Indian has escaped to the shore and hidden behind a log. Now, my friends, we are sure to be overthrown. But the other one said, ‘I will come with you, for there is none to miss me’.

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What is meant by …

Culture refers to the beliefs and expectations that surround us. We are not conscious of living in a culture, yet a fish would not be aware that it lives in water, yet it powerfully influences us.

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The theory

Frederic Bartlett (1932) conducted the War of the Ghosts study to support his theory of reconstructive memory. We looked at this study on the previous spread and we showed how people tend to remember the overall meaning of the events and reconstruct the story from this overall meaning. This shows that memory is an active process—people don’t behave like a passive memory machine, recording everything that happened. They actively reconstruct a memory.

Memory is inaccurate

Many people believe that they have a very exact recall for events that have happened in their past. It is quite likely that you have argued with a friend about something in the past. Your friend’s memory and your memory don’t match and you feel very sure that you are right. Your memory may seem very real and accurate.

Psychologists too believed that memory was simply an act of reproduction—that we store information about an event and recall it later without altering the record in any way. However, Bartlett challenged this and proposed that memory was an active process. We store fragments of information and when we need to recall something we build these fragments into a meaningful whole. The result is that elements are missing and memories are not an accurate representation of what happened.

Reconstruction

According to Bartlett the information we store in our long-term memories has been changed before it is ‘recorded’. We ‘record’ small pieces of information and later, when recalling the event, we reconstruct the pieces to tell the whole story. Each time you retell the story the elements are combined slightly differently.

Social and cultural influences

A key part of Bartlett’s theory is that the way we store and later recombine the ‘small pieces’ can be related to social and cultural expectations. In the picture on the right, the way participants remembered the picture was influenced by what they expected to see—‘that a black person is more likely to be the attacker.’

In the War of the Ghosts study, people transformed parts of the story that didn’t fit their own cultural expectations; for example, in the actual story the young man was ‘hunting’; this was often misremembered as going fishing—more common activity for British young men.

Socio-cultural expectations may influence storage and/or recall. Bartlett called his work ‘the psychology of remembering’.

Effort after meaning

In the War of the Ghosts what people recalled was the general meaning of the events rather than specific details (though they did remember some of these too). Bartlett used the phrase ‘effort after meaning’ to describe this. What he meant was:

1. We focus on the meaning of events.
2. Afterwards we make an effort to interpret the meaning in more familiar terms. In other words, we try to make sense of the ‘fragments’.

Study tip

Real-world application

One of the key aims of science is to produce knowledge that can be used in the ‘real world’. In psychology, we therefore look for ‘real-world applications’ of research. If a study or theory can produce such applications this is a strength of the method (as is the case in the ‘real-world application’ above).

Evaluation

More realistic research

Point: One strength is that Bartlett’s way of investigating memory reflects how we actually use memory in everyday life, which is more realistic than research using word lists to be remembered.

Explanation: Before Bartlett’s work, psychologists investigated memory using rather artificial materials to be learned such as nonsense syllables and word lists (e.g. RTC and KLO). These are ‘artificial’ because we usually use our memories to deal with such things. (The reason to use them in research is because then any difficulties with memory are not related to the complexity of the material to be remembered. It is a kind of control in research.)

This means that the social origins of memory were obscured in such artificial research. Bartlett’s findings are more relevant to real-life memory processes. It is worth mentioning that for many years Bartlett’s work was regarded by psychologists as rather untrustworthy because it lacked careful controls. More recently psychologists have again started using more qualitative methods similar to those used by Bartlett.

Some memories are accurate

Point: One weakness is that it is wrong to suggest that all memories are evaluations or affected by factors such as memory. Bartlett’s research was conducted by Loftus and Palmer (1974). They showed participants a film involving a car accident and afterwards asked them the following question: ‘About how fast were the cars going when they hit each other?’

Not all participants had the same question—the other participant was asked: ‘About how fast were the cars going when they smashed into each other?’

If the question contained the word ‘smashed’ then people gave a higher speed estimate than when ‘hit’ or ‘bumped’ were used.

Loftus later demonstrated that these ‘leading questions’ actually changed the way that people remembered the accident. It seems that our memories can be changed relatively easily.

1. Outline two criticisms of the theory of reconstructive memory. [4 marks]
2. Explain how effort after meaning can be used to explain how people reconstruct their memories. [3 marks]
3. Ann and Marty were at the bank when a person attempted to rob it. Later, when they were at the police station, they gave different accounts of the incident. Ann said the incident happened in a different order than Marty recalled. They also remembered the robber wearing different clothes and said different things to the police at the bank than Marty recalled.

Use your knowledge of the theory of reconstructive memory to explain why Ann and Marty have different memories of the same event. [6 marks]
Factors affecting the accuracy of memory: Interference

One of the things that memory researchers are concerned with is forgetting. You actually may be more interested in the question "why do I forget things?" instead of "why do I remember things?" – especially when you are thinking about exams.

One explanation for forgetting is called interference. Forgetting may occur if two memories compete with each other. This is especially likely if the two memories are quite similar. This was investigated by John McGeoch and William McDonald (1933).

**McGeoch and McDonald’s study: Aim**

If you learn a list of words and then do a second activity, and then try to recall the original words – does the second activity interfere with recall of the original words? Does it matter what this second activity is? This study aimed to see what effect the second activity has on the accuracy of memory.

**Method**

Twelve participants had to learn a list of ten words until they could remember them with 100% accuracy. They then were shown a new list. There were five different kinds of lists that were shown to the participants:

- List 1: synonyms – words with the same meaning as the originals.
- List 2: antonyms – words with the opposite meaning to the originals.
- List 3: words unrelated to the original ones.
- List 4: nonsense syllables.
- List 5: three-digit numbers.

Control condition: No new list – the participants were just retested.

**Results**

When the participants were then asked to recall the original list of words, their performance depended on the nature of the second list. The most similar (lexical synonyms) produced the least accurate recall. All the results are shown in the graph below.

Graph showing results of the study by McGeoch and McDonald

**Conclusion**

The results show that interference is strongest when an interfering activity is similar. In other words forgetting is more likely to happen if you try to do something else quite similar afterwards.

**Evaluation**

**Controlled research**

**Point:** One strength is that the researchers in this study used a number of techniques to ensure that their test of memory was unbiased.

**Explanation:** One of the techniques they used was counterbalancing. If all participants had the intervening word lists in the same order this might explain why they did worse with synonyms and best with no new list.

To control for the effect of order they gave the participants the lists in a different order – some participants were shown list 1 first whereas for others it was second, third, etc.

Good control is a strength of this research and laboratory studies in general.

**Artificial task**

**Point:** One weakness is that in this study interference was tested using word lists, which do not reflect real-life memory activity.

**Explanation:** In our everyday lives we don’t often have to remember lists of words and we don’t often have to remember very similar things. Therefore, this study only tells us about one aspect of memory – when we try to remember two things that are quite similar.

Interference as an explanation for the accuracy of memory is therefore limited to some very specific conditions.

**EXTRA: Not really forgetting**

**Point:** Another weakness is that interference may not be an explanation of forgetting.

**Explanation:** It is possible that interference affects are just temporary and that information is not actually forgotten. If participants are given a cued recall test (given options to aid recall) they recall many of the items that were apparently forgotten (Saying and Pitta 1971).

This shows that the information is stored in memory but simply not accessible.

### Apply it – concept

**Sally’s social science setback**

Read the item below and then answer the question that follows.

Social influence is a topic in Psychology which is very similar to Sociology. Sally is studying both GCSE Psychology and Sociology and has a test in both subjects in the same week. Even though she enjoys both subjects she did not perform well on her assessments. Sally is upset as she usually does well on her assignments but felt more confused when doing the tests even though she prepared well for both of them.

**Questions**

1. What was the dependent variable in this study?
2. Explain how interference can be used to explain accuracy in memory.
3. Explain why interference studies may lack validity.

### Apply it – research

**Word lists**

Two researchers recruited 20 participants for a study into memory.

Task A: The participants had two minutes to learn a list of 50 words (List 1). They were then asked to recall the list.

Task B: The same participants were given a list of 50 different words (List 2) to learn in two minutes. This was taken away and they were given another list of 50 different words (List 3). The participants studied this list for another two minutes. List 3 was removed and the participants had to write down as many words from List 2 as they could remember.

**Questions**

1. What was the dependent variable in this study? [1 mark]
2. Identify the experimental design the researchers used and explain one strength of this design. [1 mark + 2 marks]
3. The researchers know they would have to use counterbalancing in this experiment. Explain what is meant by counterbalancing. [2 marks]
4. Give one reason why the researchers should use counterbalancing in this study. [2 marks]
Factors affecting the accuracy of memory: Context

The specification says...
Factors affecting the accuracy of memory, including context.

Sometimes when you feel sad, you feel that everything is going wrong - you have no money, too much work to do, no friends... Being sad acts like a trigger and links to all your other memories that make you feel sad. The environment you are in can also act as a trigger to recalling memory.

What is meant by...
Context is the situation in which something happens. Context can act as a cue to recall information that enhances the accuracy of memory.

Stretch and challenge
You could try it yourself - but not necessarily learning lists of words underwater. There are many other ways to test context effects. For example, everyone in your class could learn a list of 16 words. Your teacher should read the word list out twice. Then the class should leave the classroom. Half of the students should move to a different room - for example, everyone in your class could learn a list of 16 words. Your teacher should read the word list out twice. Then the students should move to a different room. Half of the students should move to the original classroom. Participants should be given two minutes to write down as many words as possible. Which group recalled more words?

Graph showing results from Godden and Baddeley's study

Results
The environment you are in (context) can also act as a trigger to recalling memory.

Conclusion
This suggests that the context of learning acts as a trigger or cue when trying to remember the information - in other words context enhances the accuracy of memory.

Certain cues (cues) can be encoded in memory at the time of learning. For example, if you think about one of your primary school classrooms, it may trigger a memory of something that you learned in that classroom. Research shows that, in this way, context can increase the accuracy of memory. One such study was conducted by Duncan Godden and Alan Baddeley (1975). A friend of theirs had been in charge of a team of divers who had to record how many fish entered or escaped from travel nets. The divers appeared unable to remember their totals when they returned to land (it's quite hard to record information underwater). It was only when they had to record their observations while underwater that they produced an accurate record.

Godden and Baddeley's study: Aim
This led Godden and Baddeley to see if they could demonstrate that recall for things learned underwater is more accurate if recall is also underwater, i.e. does context improve recall?

Method
Eighteen participants were recruited who were all members of a diving club. The divers had to listen to a list of 16 unrelated words either on the beach (dry), or under about 10 feet of water (wet).

The divers were tested after about 4 minutes to see how many words they could recall. They were tested either on the beach or underwater.

There were four groups of participants:
- Group 1: learned on beach, tested on beach: dry (DD)
- Group 2: learned underwater, tested on beach: wet-dry (WD)
- Group 3: learned on beach, tested underwater: dry-wet (DW)
- Group 4: learned underwater, tested underwater: wet-wet (WW)

In two of these conditions the environmental context of learning and recall matched, whereas in the other two they did not. Groups 1 and 4 are matching - the environment, where the words were learned might trigger their recall. For groups 3 and 4 the context could not act as a cue.

Graph showing results from Godden and Baddeley's study

Results
The environment you are in (context) can also act as a trigger to recalling memory.

Conclusion
This suggests that the context of learning acts as a trigger or cue when trying to remember the information – in other words context enhances the accuracy of memory.

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The environment you are in (context) can also act as a trigger to recalling memory.

Conclusion
This suggests that the context of learning acts as a trigger or cue when trying to remember the information – in other words context enhances the accuracy of memory.

Evaluation

Artificial task

Point: One weakness is that word lists were used to test memory, which is not a ‘natural’ way to investigate recall.

Explanation: This is a field experiment so the environment is ‘natural’ - but the task isn’t ‘natural’. The aim of the study was to look at whether divers could remember information better in the same environment where they learned it – but the learning involved observing what fish did, not learning word lists. The word-learning task was a very simple one. Subsequent research has found that tasks involving complex materials don’t show strong object/cue effects: This shows that the findings can’t be applied in all situations.

Recall was short term

Point: Another weakness is that participants had to recall the words almost immediately, which is a very specific effect.

Explanation: If we want to generalise context effects to other situations, then a short time gap may be unrealistic. For example, if we wanted to suggest that these results had implications for exam study then we would want to know if context effects applied to long gaps between original learning and much later recall. Therefore this research only tells us about a very specific set of circumstances – short-term recall.

EXTRA: Similar context

Point: Another weakness is that the effect only applies to very similar situations.

Explanation: Context only acts as a cue for recall if the context at the time of learning is very similar to the context at the time of recall. In reality most information, such as learning material to be tested in an exam, is not affected by context because the initial learning takes place in multiple contexts (Smith 1982). Therefore context effects do not affect the accuracy of recall in many situations.

Smells can trigger memories.
The picture shows a ‘viking’ couple preparing dinner at the Jorvik Viking Centre in York, where smells are much more of a feature of the display.

Aggleton and Waskett (1999) used this smell museum to test recall in people who had visited the museum up to three years previously.

Participants were asked to answer a questionnaire about the contents of the museum. When participants did this they were surrounded by some of the smells from the museum: their recall was much more accurate than if there were other smells while completing the questionnaire.

In this study smell acted as a context cue. Can you think of a smell that triggers a memory for you?

Hamza’s Exam

Read the item below and then answer the question that follows.

Hamza has an exam phobia and as a result is allowed to take his psychology exam in his psychology classroom rather than the exam hall. Even though all information relevant to the exam is taken down from the walls, Hamza still finds that he performs better than the other students who did their exam elsewhere.

Question
Use your knowledge of psychology to explain how context could have affected the accuracy of Hamza’s memory.

1. Imagine that you are a psychologist and you are interested to see if changing the context of learning and recall affects a person’s memory. Use your knowledge of psychology to describe:
   • How the study would be carried out.
   • How you would measure the effect of changing the context.
   • The results that you would expect to find in line with the results of past research into context.

2. A teacher has two history classes. She decides to do an experiment where she takes one of her classes into the exam hall to revise for their end of year exam and she revises in the classroom with her other class. She finds that the class she takes to the exam hall to revise do better in their exam than the class she revises with in their classroom.
   Explain how being able to recall information can be affected by context. Refer to the example above in your answer.

3. Describe and evaluate a study that investigated how context affects the accuracy of memory.
Factors affecting the accuracy of memory: False memories

In 1975 Australian psychologist Donald Thomson was visiting the US and was hospitalized when he was arrested for committing an assault and rape. The victim identified him as her assailant and later picked him out in a line-up.

He had an alibi – at the time the attack occurred he was attending a business conference in another state. The police at first did not believe this but later the victim admitted she had been watching the show before she was attacked.

What had happened was that a false memory had been created. In her mind she had substituted the actual attacker for the real person who committed the crime.

This was an example of a reconstructed memory.

Elizabeth Loftus (1944 –)

In a review of 20th-century psychologists Elizabeth was the top-ranked woman on the list. She is Distinguished Professor at the University of California, Irvine. Originally, she had planned to be a maths teacher but discovered psychology at university and has made an enormous contribution to understanding eyewitness testimony. Loftus has been an expert witness in hundreds of cases, especially related to understanding false memories, particularly those involving memory manipulation.

Study tip

1. Outline one criticism of research into how false memory affects the accuracy of memory. (2 marks)
2. Describe the results and conclusion of one study that investigated false memory. (4 marks)
3. Mark, a full-time clothes model was arrested for stealing a mousetrap. The victim admitted she had seen a picture of Mark in a magazine she was reading before her handbag was stolen.

Mousetrap

A psychologist recruited eight children (all 11 years old). She created a list of events that had happened to the children when they were younger but added one event that never happened – visiting hospital after getting their finger caught in a mousetrap. The psychologist discussed the events in the list with each child once a week for five weeks. She recorded how many children believed the mousetrap event had really happened.

This suggests that false memories can be created which are good for people.

Point: The ethics of conducting research on false memory.

This suggests that therapists can actually create false memories, or are they just recovering real memories?

Point: It may well be that relatively harmless events such as being lost in a mall can be implanted quite easily but this does not mean that the same would be true of something much more traumatic and memorable.

EXTRA: Real-world application

Aim: One strength of this research is that it has important implications for eyewitness testimony.

Explanation: After a crime has been committed, eyewitnesses are interviewed by police. The police may unconsciously ask questions in such a way that they may implant a false memory. For example, they might ask ‘Did you see a gun in his hand’ instead of ‘Did you see anything in his hand’? Loftus has shown in many different studies that such questions can create false memories (e.g. Loftus and Palmer 1974, see page 25 ‘Stretch and challenge’).

This research has changed the way courts deal with eyewitness testimony – it is no longer regarded as reliable evidence.

1. Outline one criticism of research into how false memory affects the accuracy of memory. (2 marks)
2. Describe the results and conclusion of one study that investigated false memory. (4 marks)
3. Mark, a full-time clothes model was arrested for stealing a woman’s handbag from a café. The victim, called Debbie, identified him as stealing her handbag and picked him out from a line-up.

Ethical issues

A recent newspaper article has given to wider society so that you are putting yourself in a difficult position.

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Chapter 1 Memory

Summary

Encoding experiences, storing them in long-term memory and being able to remember them later.

**Processes of memory**

- **Encoding**
  - Changing information from a form so it can be held in the brain.
  - Visual encoding
    - Changing information by how it looks so it can be stored.
  - Acoustic encoding
    - Changing information by how it sounds so it can be stored.
  - Semantic encoding
    - Changing information by how it means so it can be stored.
  - Other encoding
    - Storing encoding, memory of what things feel like to touch.

- **Storage**
  - Holding information in memory so that it can be retrieved later.

- **Retrieval**
  - Locating and bringing back information into mind.

**Structures of memory**

- **Multi-store model**
  - Three memory stores: different coding, capacity and duration. Information moves through attentional and verbal rehearsal.
  - Sensory memory
    - Very short duration, large capacity.
    - Information transferred to STM.
  - STM
    - Limited duration (3-12 seconds) and capacity (5-9 items), acoustic coding.
    - Made of rehearsal
      - Rehearsal keeps information in STM.
    - Semantic coding, unlimited capacity and stored up to a lifetime.
  - LTM
    - Episodic memory
      - Memory for events from your life.
    - Semantic memory
      - Memory of what things mean (your own encyclopedia).

**Memory as an active process**

- **Factors affecting the accuracy of memory**
  - **Interference**
    - **Goldstein and Baddeley’s study Aim**
      - To see if context improves recall.
    - **Method**
      - Lists of words were used. When more complex materials were used, better recall was found.
    - **Results**
      - Recall was highest in the same environment for learning and recall.
    - **Conclusions**
      - Context content acts as a trigger or cue, improving the accuracy of memory.
  - **False memories**
    - **Leffert and Pickrell’s study Aim**
      - To see if false memories could be created in participants through suggestion.
    - **Method**
      - Four stories about childhood events were read where few were true and one was false (shopping mall).
    - **Results**
      - 8 out of 24 (33%) of participants recalled the false story help or partially.
    - **Conclusions**
      - Imagining an event can implant a false memory in a person, reducing accuracy of memory.

- **Memory may become more or less accurate.**

- **The theory of reconstructive memory**
  - **Bartlett’s War of the Ghosts study**
    - **Aim**
      - To see if memory is reconstructed when telling an unfamiliar story.
    - **Method**
      - The War of the Ghosts story was read by one participant and recalled after 15 minutes, then read by another participant and recalled and so on. Results
      - Participants changed the story to fit cultural expectations, leaving out unfamiliar information.
    - **Conclusions**
      - We use our knowledge of social situations to reconstruct memory.

**Evaluation**

- **Types of LTM**
  - **Types of retrieval**
    - **Free recall**
      - Without cues.
    - **Types of retrieval**
      - **Retrieval**
        - Holding information in memory so that it can be retrieved later.
        - **Storage**
          - Storing encoding, memory of what things feel like to touch.

- **Evaluation**
  - **Specific locations in the brain**
    - Olfactory encoding: memory for smell.
    - Tactile encoding: memory of what things feel like to touch.
    - Other encoding
      - Semantic encoding
        - Acoustic encoding
        - Visual encoding
  - **Encoding experiences, storing them in long-term memory and being able to remember them later.**

- **Evaluation**
  - **Evaluation of Bartlett’s War of the Ghosts study**
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**Question 1: Outline what is meant by the term encoding. [2 marks]**

Amanda's answer:

Encoding is when information changes form when it goes into memory. For example, reading your revision notes out loud would be an example of acoustic encoding as you are using sound to remember something.

Jay's answer:

Encoding involves the different ways you put information into your memory.

Selema's answer:

Encoding is the process of storing information in your memory for either a short or long amount of time.

**Question 2: Describe the multi-store model of memory. [4 marks]**

Amanda's answer:

The model suggests that information from the environment goes into our sensory memory, which relates to different senses like hearing and vision. All the information we pay attention to goes into STM where it will remain for up to 30 seconds if it is not rehearsed. STM has a limited capacity of between 5 and 9 items and encodes information acoustically. If we rehearse something for long enough then it goes into LTM, which is known as maintenance rehearsal. Our STM has an unlimited capacity and once information is there it stays there for up to a lifetime as it has a very long duration as well.

Jay's answer:

This theory relates to how we remember things in our memory. It says that we have a short-term memory and a long-term memory and in order to remember things we must repeat them. Short-term memory can last up to a day whereas long-term memory has an unlimited duration. The model states that we also learn through paying attention.

Selema's answer:

The model suggests that memory has three main stores and we rehearse information in order to remember it. We receive information through our senses that goes into sensory memory and if we pay attention to it then it goes into STM. Rehearsal can be used to transfer information to LTM and keep information in STM so we don't forget it.

**Question 3: Outline one criticism of Bartlett’s War of the Ghosts study. [2 marks]**

Amanda's answer:

Bartlett’s research lacked control as he did not specify things like how the words were read or what other factors could affect the participants' recall.

The criticism is thoroughly outlined by Amanda. The point is clearly identified and features elaboration to justify why the point stated in a weakened version of Bartlett’s research.

Jay's answer:

His study had a high amount of extraneous variables as his participants were not told the same thing every time they did it.

Selema’s answer:

His study lacked control which meant that any results found would lack validity.

Jay’s answer:

The criticism is not linked to the study. When evaluating, it is important to link the criticism to what goes on in the study. For example, giving examples from his study of how it lacked control by not having any standardised instructions.

Selema’s answer:

The study lacked control which meant that any results found would lack validity.

Jay’s answer:

The study lacked control which meant that any results found would lack validity.

Selema’s answer:

The study lacked control which meant that any results found would lack validity.

**Question 4: Ellen had a motorcycle accident that left her partially brain-damaged. She can still remember facts and information such as who the current prime minister is. She is also able to perform certain automatic skills like riding a bike. However, she struggles to remember events that happened to her before the accident, which is particularly distressing to her friends and family as she just turned 21 the previous month but has no recollection of her wonderful birthday.**

Use your knowledge of different types of long-term memory to explain Ellen’s behaviour. [6 marks]

Amanda’s answer:

Ellen’s recovery is accurate and detailed. She explains the different types of memory very well and uses terminology in a confident manner. She applies her knowledge very effectively by making clear links between psychological concepts and examples of Ellen’s behaviour.

Jay’s answer:

Ellen has memory problems as her episodic memory is damaged. The other parts of her memory are OK though as she has semantic memory ability and also has nothing wrong with the procedural part of her brain.

Selema’s answer:

Ellen’s response is also basic in the sense that, although she has correctly identified which type of memory is damaged, she has not used the correct terminology to identify them. Her answer would also have benefited by greater detail when explaining the different types of memory.

**Question 5: Describe and evaluate Murdock’s study on the serial position curve. In your answer include the method used, the results obtained and the conclusion drawn. [9 marks]**

Amanda’s answer:

Murdock wanted to see if the position of a word on a list affected how well it would be recalled. He got psychology students to listen to lists of words that varied from 10 to 40 words and after each list they had to recall the words they could remember. Murdock found that the students were better at remembering the words at the start and end of the lists but less good at remembering those in the middle. He called this the serial position effect as the position of the words in the list affected how well they were remembered.

A problem with this study was that memory was only tested through having participants recalling word lists. In the real world we use our memory in lots of different ways, such as playing basketball or remembering something that happened to us. This makes the results of this study lack validity as they don't relate to how we use our memories in other areas of our lives.

The investigation was also well controlled. Other things that could have affected the DV, like the speed that the words were read to the participants and the familiarity of the words, were kept the same. This would have given the study’s findings greater validity into how our memory works.

Amanda’s response starts off by giving an accurate and detailed outline of Murdock’s study that clearly identifies the aim, method, findings and conclusion of the study in order to show a clear understanding of the research. Relevant evaluation is mentioned and each judgement is made in a thorough manner with elaboration that displays a depth of analysis.

Terminology is used confidently and effectively throughout and the answer is clear and coherent.

Overall, this answer describes and evaluates the study in an accurate and thorough manner.

Jay’s outline of the study is clear and accurate but the description is basic because very little actual detail has been given for the method, findings and conclusion. For example, the different types of word lists could have been described. The terminology, on the other hand, is reasonable.

However, his evaluation is much more basic. Although he identifies some relevant points and offers some elaboration, it is not linked to the actual study.

Evaluation counts for a lot in an essay so this affects the quality of it overall.

Overall, this is a basic answer.
Multiple choice questions

Chapter 1 Memory

Processes of memory: Encoding, storage and retrieval

1. Some memories are stored in terms of their meaning. Which type of encoding is this?
   (a) Visual
   (b) Acoustic
   (c) Semantic
   (d) Tactile

2. Learning something by putting it to music is an example of
   (a) Retrieval
   (b) Acoustic encoding
   (c) Tactile encoding
   (d) Visual encoding

3. The three stages of the memory process (in the correct order) are:
   (a) Encoding, retrieval, storage
   (b) Visual encoding, acoustic encoding, retrieval
   (c) Encoding, storage, retrieval
   (d) Encoding, recognition, retrieval

4. Answering a multiple-choice question in an exam is an example of:
   (a) Recognition
   (b) Free recall
   (c) Acoustic encoding
   (d) Semantic encoding

Processes of memory: A study of encoding

1. Baddeley’s main aim was to find out:
   (a) Which words are semantically similar
   (b) How long information is stored for in STM
   (c) If STM and LTM use different types of encoding
   (d) What is the main function of STM

2. Which of the following is an acoustically similar word list?
   (a) Pit, cow, cow
   (b) Great, large, big
   (c) Good, huge, hot
   (d) Cat, call, can

3. In Baddeley’s study, the type of encoding used in STM was:
   (a) Visual
   (b) Semantic
   (c) Tactile
   (d) Acoustic

4. Baddeley’s experiment was well controlled. An example of this was:
   (a) Calculating how many words the participants got wrong
   (b) Using lists of similar and dissimilar words
   (c) Explaining to the participants what the study was about afterwards
   (d) Giving participants a hearing test beforehand

Factors affecting accuracy of memory: Interference

1. Interference causes:
   (a) Retrieval
   (b) Memory capacity
   (c) Forgetting
   (d) Memory deconstruction

2. In the study by McGeoch and McDonald participants had to learn word lists which had:
   (a) 5
   (b) 10
   (c) 15
   (d) 20

3. McGeoch and McDonald concluded that the factor making interference strongest is:
   (a) Primacy effect
   (b) Recency effect
   (c) Serial position effect
   (d) Dependent variable of the study

4. Godden and Baddeley studied:
   (a) Swimmers
   (b) Diving club members
   (c) The overall meaning of something
   (d) Primacy effect

Factors affecting accuracy of memory: False memories

1. In Loftus and Pickrell’s study, participants were falsely told that as children they had:
   (a) Become lost in a shopping mall
   (b) Fallen out of bed
   (c) Bitten the dentist
   (d) Kicked Santa Claus

2. The proportion of participants in Loftus and Pickrell’s study who recalled the false story fully or partially was:
   (a) 25%
   (b) 50%
   (c) 75%
   (d) 100%

3. False memories are based on the concept of:
   (a) Repeated reproductions
   (b) The serial position effect
   (c) Acoustic encoding
   (d) Reconstructive memory

4. A weakness of Loftus and Pickrell’s study is:
   (a) They didn’t tell us about memories over days and weeks
   (b) They were all professional drivers
   (c) The gap between learning and recall was very long
   (d) It was conducted in an artificial lab

MCQ answers

Multiple choice questions

Encoding, storage and retrieval

1c, 2b, 3c, 4a

A study of encoding

1c, 2d, 3d, 4d

Multi-store model of memory

1a, 2c, 3c, 4a

Bartlett’s War of the Ghosts study

1c, 2c, 3d, 4b

The theory of reconstructive memory

1d, 2c, 3a, 4d

Factors affecting accuracy of memory: Context

1. Goldren and Baddeley studied:
   (a) Fishermen
   (b) Diving club members
   (c) Swimmers
   (d) Players

2. The best recall in this study happened when words were learned:
   (a) Underwater and recalled on the beach
   (b) Underwater and recalled underwater
   (c) On the beach and recalled underwater
   (d) On the beach and recalled on the beach

3. Godden and Baddeley concluded that environmental context is:
   (a) A can that triggers accurate recall
   (b) Of no help in remembering information
   (c) Very useful for improving swimming
   (d) More useful in the lab than in the real world

4. A serious weakness of Godden and Baddeley’s study is:
   (a) It didn’t tell us about memories over days and weeks
   (b) The participants were all professional divers
   (c) The gap between learning and recall was very long
   (d) It was conducted in an artificial lab

Factors affecting accuracy of memory: False memories

1. Godden and Baddeley concluded that environmental context is:
   (a) A can that triggers accurate recall
   (b) Of no help in remembering information
   (c) Very useful for improving swimming
   (d) More useful in the lab than in the real world

2. A significant strength of Godden and Baddeley’s theory is that it:
   (a) It oversimplifies STM and LTM
   (b) It can’t explain how information gets into LTM
   (c) It has no application to everyday life
   (d) It supports the multi-store model

3. Bartlett believed that memory is:
   (a) Episodic
   (b) Semantic
   (c) Procedural
   (d) Declarative

4. Bartlett called our attempt to make sense of memory fragments:
   (a) Reconstructed
   (b) Primacy effect
   (c) Serial position effect
   (d) Dependent variable of the study

Memory as an active process:

1. Bartlett tested that memory is:
   (a) Acoustic
   (b) Procedural
   (c) Reconstructive
   (d) Declarative

2. Bartlett’s study transformed the story to make it:
   (a) Longer
   (b) More familiar
   (c) More complex
   (d) Interesting

3. The participants in Bartlett’s study transformed the story to make it:
   (a) Less interesting
   (b) More complex
   (c) More familiar
   (d) Shorter

4. Bartlett used the method of:
   (a) Recognition
   (b) Serial position effect
   (c) Cued recall
   (d) Serial position effect

5. Bartlett concluded that memory is:
   (a) Consistent over time
   (b) Almost always accurate
   (c) Acoustically encoded
   (d) An active process

6. Bartlett called our attempt to make sense of memory fragments:
   (a) Effort after meaning
   (b) The serial position effect
   (c) The multi-store model
   (d) Memory deconstruction

7. Bartlett proposed that memory is:
   (a) Dependent variable of the study
   (b) Acoustic encoding
   (c) Semantic encoding
   (d) Tactile encoding

8. Bartlett’s study transformed the story to make it:
   (a) Longer
   (b) More familiar
   (c) More complex
   (d) Shorter

9. The overall meaning of something is:
   (a) Primacy effect
   (b) Recency effect
   (c) The start and end of a story better than the middle
   (d) All aspects of a story equally well

10. Bartlett believed that memory is:
    (a) Acoustic
    (b) Procedural
    (c) Reconstructive
    (d) Declarative

11. Bartlett concluded that memory is:
    (a) Consistent over time
    (b) Almost always accurate
    (c) Acoustically encoded
    (d) An active process

12. Bartlett proposed that memory is:
    (a) Dependent variable of the study
    (b) Acoustic encoding
    (c) Semantic encoding
    (d) Tactile encoding

13. Bartlett called our attempt to make sense of memory fragments:
    (a) Effort after meaning
    (b) The serial position effect
    (c) The multi-store model
    (d) Memory deconstruction

14. Bartlett believed that memory is:
    (a) Dependent variable of the study
    (b) Acoustic encoding
    (c) Semantic encoding
    (d) Tactile encoding

15. Bartlett concluded that memory is:
    (a) Consistent over time
    (b) Almost always accurate
    (c) Acoustically encoded
    (d) An active process

16. Bartlett called our attempt to make sense of memory fragments:
    (a) Effort after meaning
    (b) The serial position effect
    (c) The multi-store model
    (d) Memory deconstruction