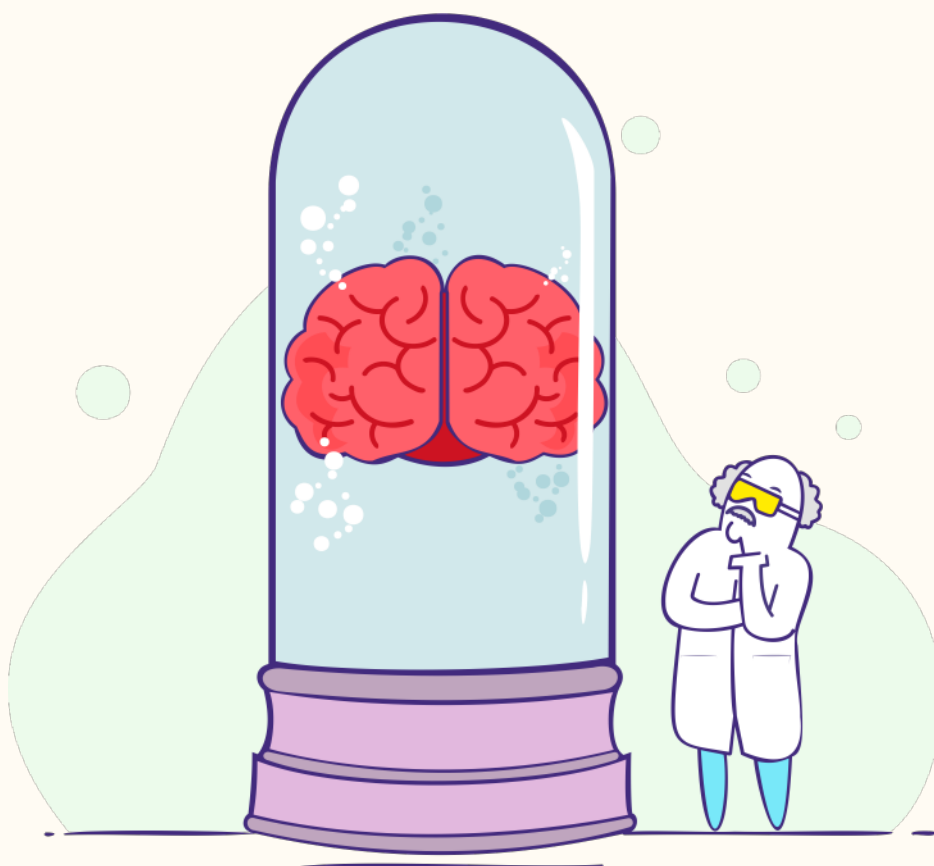G ⭐⭐⭐⭐⭐ 5/5

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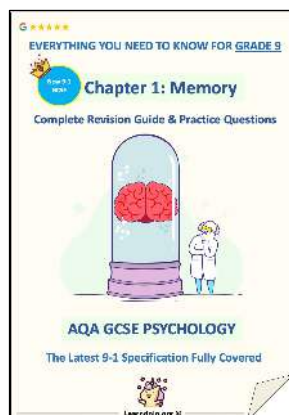
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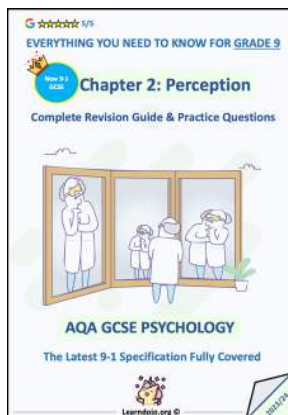2023/24

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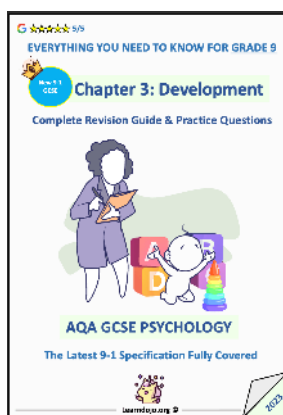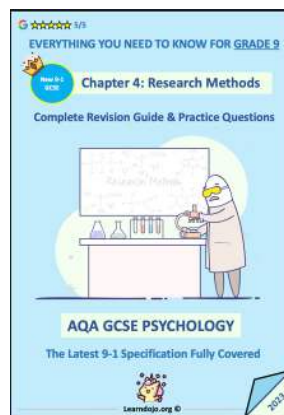
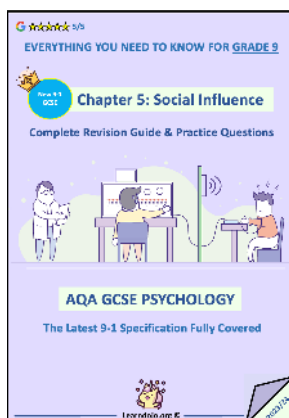EVERYTHING YOU NEED TO KNOW FOR GRADE 9

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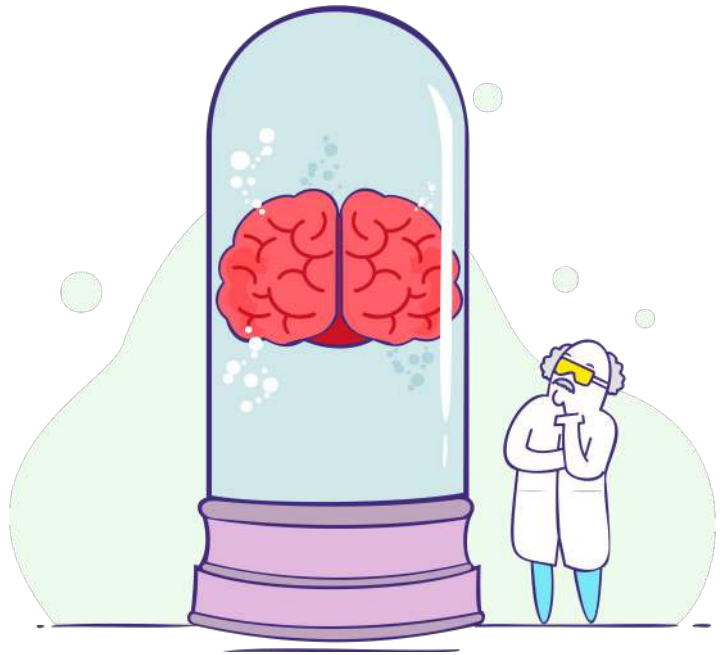
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What is memory?

Memory is defined as the encoding, storage and the retrieval of stored information once needed. There are three forms of encoding used within memory which are:

1. **Acoustic encoding**
2. **Visual encoding**
3. **Semantic encoding**

The three types of retrieval systems used by memory are:

1. **recall**,

2. **recognition**

3. **re-learning**.

Focus is on the amount of information stored (**capacity**), the length of time it is stored (**duration**) and the way information is stored (**acoustic, visual or semantic**).

Processes of Memory

There are different types of memory we use to function with each serving a different purpose.

Research has shown that memory can generally be divided into the following types:

1. **Episodic memory**

2. **Semantic memory**

3. **Procedural memory**

1. Episodic Memory

Episodic memory refers to memories of personal events or experiences you may have had in your life that are personal to you i.e. places you visited or events that happened.

An example of episodic memory could be when you remember your first day of school or a holiday you had taken last year.

2. Semantic Memory

Semantic memory is a memory for facts and general knowledge.

An example of semantic memory is knowledge about the **meaning of words**.

For example, what is the capital of England? The answer, of course, is London, however, you have relied on your semantic memory to help you recall this fact.

3. Procedural memory

Procedural memory is the memory that helps us recall information on complicated skills. An example of this is how we recall the information we need to carry out **action-based memories** such as riding a bike, to swim or to tie our shoelaces.

Procedural memory is believed to be stored using a motor code rather than a verbal code. This is why children need to be shown how to do tasks such as riding a bike or swimming, rather than having it explained to them.

How are memories encoded, stored and retrieved?

Encoding is the processing of information in some form into our memory.

Research into how memories are encoded have focused on three forms of encoding:

1. **Acoustic encoding (sound)**
2. **Visual encoding (picture)**
3. **Semantic encoding (meaning)**

1. Acoustic encoding

Acoustic encoding is the holding of information in your memory in the form of sound.

One example of this is when we are given a mobile phone number to remember; we repeat the number to ourselves to maintain the memory acoustically until we are able to write it down on paper.

2. Visual encoding

Visual encoding is when we process information visually in the form of a picture in our mind.

One example of how information is encoded visually is if I asked you to think about how big your garden is? If you begin to picture your garden in your mind right now in an effort to answer this, this would be an example of visual encoding.

3. Semantic encoding

Semantic encoding refers to encoding something through its meaning.

An example of semantic encoding would be if I asked you to name David Beckham's spouse and all his children. To think about this, you may need to involve some visual processing as you picture them together but you will also need to think about what the word spouse means to decipher it's his partner. You may then ask yourself how many children he has and this may involve some visualisation. As you visualise his children, you may then begin to ask yourself what their names are.

This process whereby you visualise them and begin to ask yourself their names; you are digging deeper to understand the meanings behind this visual image you see in your mind. This is an example of semantic encoding.

How are memories retrieved?

Once the information has been stored, there also needs to be a process for these memories to be retrieved.

Memories are believed to be retrieved in **3 different ways** which are:

* **Recall**
* **Recognition**
* **Re-learning**

Recall is a type of retrieval that is associated with remembering information as we search our memory. For example, we may be asked a question such as "What is the capital of Thailand?" In order for us to be able to answer this, we need to recall the answer which is located in our memory (assuming you know the answer!).

Recognition involves us being presented with items and being asked if we remember any of them from a previous exposure.

Re-learning involves us being exposed to something we may have learnt previously but have since forgotten (or so we think).

Once we are exposed to this again later, we are tasked with re-learning this information but usually, it doesn't take us as long as it did to initially learn it as we re-learn it much faster this time.

Structures of memory

For this chapter on structures of memory, we will be looking at Atkinson and Shiffrin's Multi Store Model of Memory. The Multi Store memory model consists of **3 key components** which we will also be examining which are:

- **The sensory memory store**
- **Short-term memory store**
- **Long-term memory store**

The Multi Store Memory Model

MULTI-STORE MEMORY MODEL
ATKINSON & SHIFFRIN(1968)
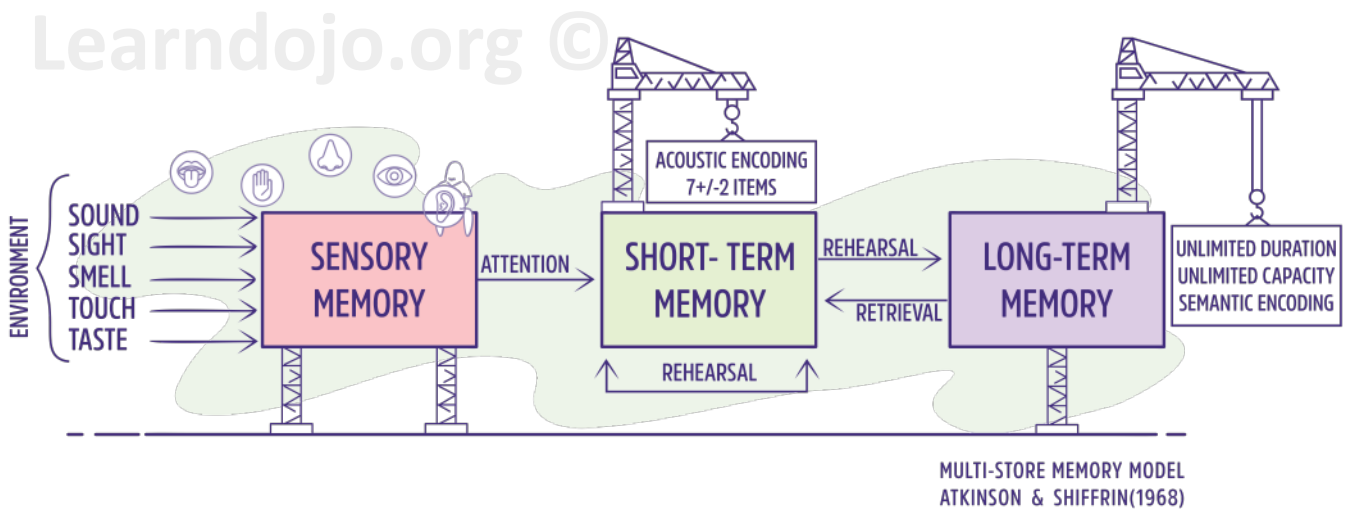
The sensory store

Our senses are bombarded with sights and sound however not all of them we pay attention to and most are discarded almost as soon as they are registered.

The first part of the multi-store model of memory is the sensory store which stores this sensory information. This store is called the sensory information store (SIS) and it is not under cognitive control. Information deemed as important and given focused attention is selected and passed on to the next store which is the short-term memory store (STM). The sensory information store has a large capacity however the duration of storage is milliseconds unless this information is given focused attention.

Research suggests encoding occurs in the way the information is received – so for example information received visually will be encoded visually.

The Multi Store Memory Model (Cont.)

MULTI-STORE MEMORY MODEL
ATKINSON & SHIFFRIN(1968)
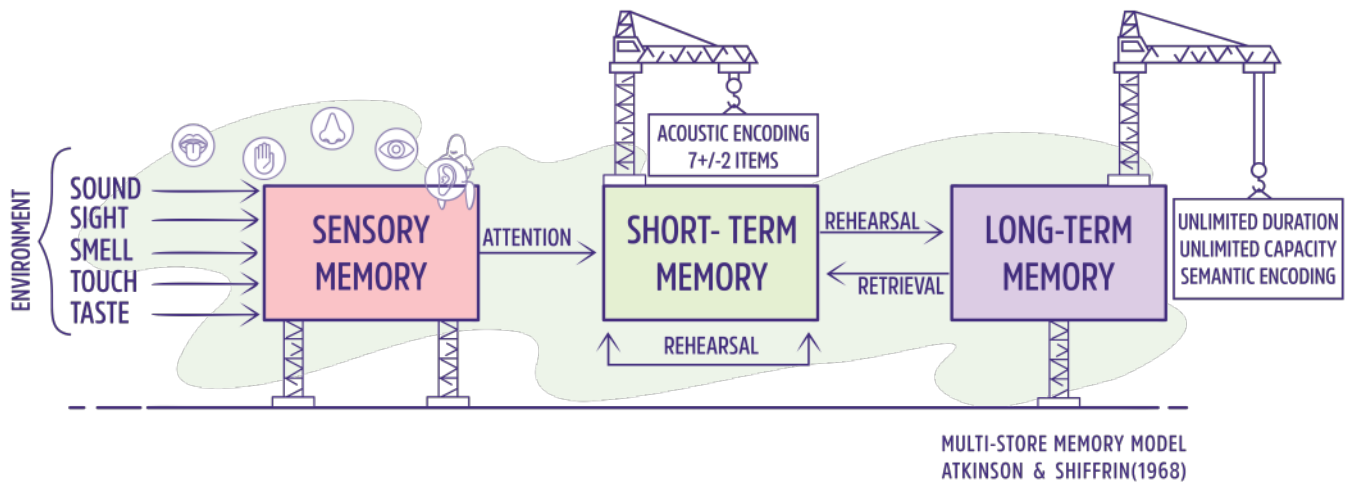
The short-term memory store

Information we choose to hold on to from the sensory store passes to the short-term memory store.

Atkinson and Shiffrin proposed that we store this information in the short-term store through **rehearsal** and **repeating** it to ourselves although this may not necessarily be out loud or consciously. Information that is not rehearsed is forgotten through **decay** or **displaced** by new incoming information due to the short-term memory store having a **limited duration of up to 18 seconds and a capacity of 7 +/- 2 items**. Encoding is mainly **acoustic** and based on sound.

Information that is rehearsed through elaborate or maintenance rehearsal passes on to the long-term memory store (LTM).

The long-term memory store

Information that is processed deeply through elaborate or maintenance rehearsal passes from the short-term memory store and into the long-term memory store. There is no specific duration for how long the information can be stored here and it could be for an entire lifetime or less. The capacity of the long-term memory store is also believed to be unlimited with encoding being mainly semantic and based on meaning.

The Multi Store Memory Model Evaluation

Strengths

- A major strength of this model is that the predictions around memory can be easily tested to verify whether it applies to human behaviour.

- The evidence supports the idea of STM and LTM being separate types of memory and it has been verified through the use of PET scans and FMRI scans when participants have been doing separate tasks related to short-term memory and long-term.

- The prefrontal cortex is seen to relate to STM while the hippocampus associated with long term memory supporting the models idea of different memory stores.

Weaknesses

- The theory is unable to explain how we are able to remember information that we do not rehearse and repetition does not necessarily make it easier to remember the information.

- For example we can recall our activities last weekend without rehearsal yet in other situations such as an exam; we may still struggle to recall information we have rehearsed.

- Other research suggests us understanding the meaning of information or how to put it into our own words is more important than simply repetition which undermines this explanation.

Primacy and Recency effects in recall

Research into memory has found that we are more likely to remember information dependant on whether it is the first thing we are exposed to or the last thing.

This has become known as the Primacy and Recency effect and has been studied through testing the recall of individuals.

The Primacy effect refers to the fact that items at the beginning of a list are in a primary position (seen first) and we are therefore more likely to remember them.

Why does the primacy effect happen?

When participants are exposed to a list of words, participants have increased rehearsal time with these first words to enable them to be encoded in the short-term memory and transferred into long-term memory.

The Recency effect refers to the fact that items at the end of a list (the most recent) are more likely to be remembered compared to the items in the middle.

Why does the recency effect happen?

It is believed the recency effect happens because the last set of words a person is exposed to are still in the short-term memory. This therefore makes their recall much easier as the information is still accessible in memory.

The Effects of Serial Position

Murdock's Serial Position curve study (1962) looked to see if the position of a word in a list had any effect on the likelihood of it being remembered better. The serial-position effect was first coined by Hermann Ebbinghaus through his own experiments conducted on himself. Ebbinghaus found that the accuracy of recall tended to vary dependant on the position of the word on the list. Murdock's study looked to validate this and in 1962, he conducted a study where people were asked to remember a list of words which varied from 10 words to 40 words.

Murdock's Serial Position Study 1962

Aim:

The aim of the study was to prove the existence of the short-term and long-term memory stores as the multi-store model of memory proposed.

Study design:

The study was a laboratory study which allowed researchers to control for extraneous variables. All procedures were standardised to ensure the experiment could be easily replicated.

Participants were male and female students who had a requirement as part of their course to take part in psychological research.

Method:

16 participants were presented with a list of 20 words at a rate of 1 word per second until all 20 words had been presented. They were then tasked with recalling as many of the words as they could remember within 90 seconds.

The test was repeated with the same participants over 80 times over a few days using different word lists each time.
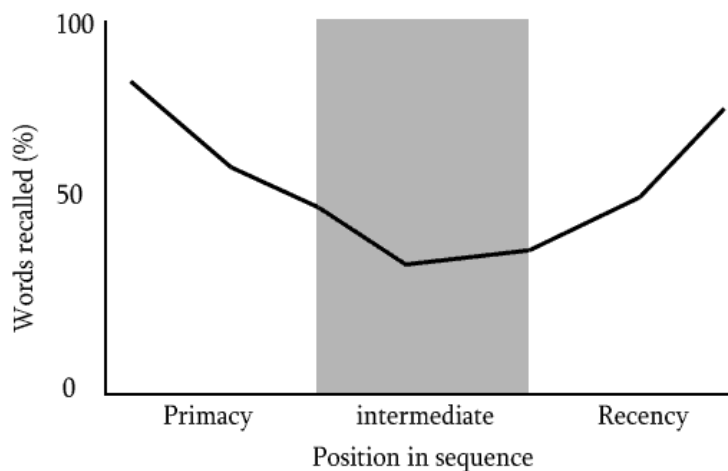
Results:

The results of Murdock's study found that the words at the end of the list and the beginning of the list were recalled the best.

Words being recalled at the end of the list became known as the recency effect.

Words recalled at the beginning of the list came to be known as the primacy effect.

Words in the middle were the least remembered.

Murdock's Serial Position Study 1962 Cont.

Conclusion:

Murdock concluded that this provided strong evidence for the multi-store model of memory and short-term and long-term memory stores being separate from one another.

Words recalled at the end of the list were seen to still be in the short-term memory store hence they were readily available for recall thus provided support for the short-term memory stores existence.

Words recalled at the beginning of the list had time to be rehearsed and had thus been transferred over to the long-term memory store ready for recall which provides support for the long-term memory stores existence.

The words in the middle were not recalled as well as they had been stored in neither the short-term or long-term store.

The results of this study found that people remembered the words that tended to be at the beginning of the list or at the end with words in the middle recalled the least.

The effects of serial position mean the chances of recalling items depends on their position and those at the beginning and end of a list having the highest chances of being recalled.

Evaluating Murdock's Serial Position Study

Strengths

- The study was repeated by Murdock with the number of words given as well as the amount of presentation time the participants were given varied yet the results still produced primacy and recency effects. This supports the validity of the multi-store model of memory.

- A variation of the study also saw the participants given a distraction task where participants were not asked to recall the words straight after hearing them but instead count backwards in threes.

- When participants were allowed to recall the words they found that the words from the beginning of the list were recalled as they had been embedded in the long-term memory but participants struggled with the words from the end of the list.

- This is believed to be because the distractor task took up the capacity of the short-term memory store which Murdock believed proved the existence of the short-term and long-term memory stores as the multi-store model of memory suggested.

Weaknesses

- The participants in this study were given lists of words to remember which is not the same use of memory in everyday life. In the real world people use their memory to remember tasks they need to do, exams, work and general day to day life.

- Therefore it could be argued the study lacks ecological validity due to its artificial setup.

- The study involved students who were all of a similar age and studying a psychology course. Due to the specific demographic involved in the study it raises the question as to whether the results can be generalised across different age groups or people of different backgrounds.

- For example the students may try and work out the aim of the study and alter the results accordingly or display demand characteristics.

- Additionally the students were required to repeat the study over 80 times and this could have affected their genuine effort levels meaning their recollection or efforts could have been affected by low motivation.

The Theory of Reconstructive Memory

Bartlett proposed the reconstructive explanation of memory and suggested memory was not simply a recording device as initially thought.

Bartlett's theory proposed that instead memories were "reconstructed" and interpreted to fit in with the hopes, fears, emotions and previous experiences of individuals. He believed people looked at memories and past events and strived to make them more logical and meaningful. This was done by the people making inferences and deductions and what should have happened. Therefore memories were not just registered exactly but constructed and reconstructed to fit in with the individuals own expectations and understanding.
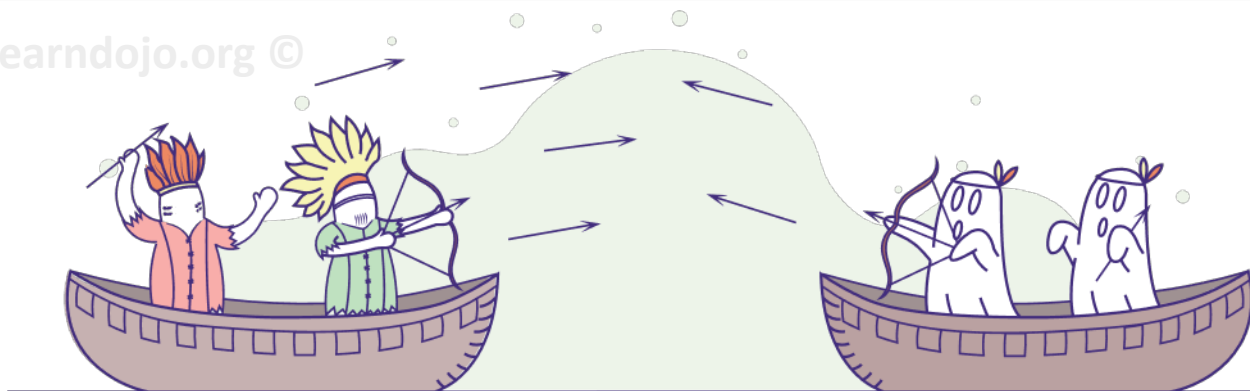
Bartlett (1932) tested the reconstructive explanation for memory through his study **"The war of the ghosts"**. He wanted to see if memory could be altered by the individual's previous experiences influencing their recall of events. To do this Bartlett played a game of "Chinese whispers" and asked students to pass on a story they are told to the next student. The story they were told was a **Native American story** which was culturally very different from what western students would be familiar to. Bartlett's story involved Native Americans travelling in canoes and fighting another group which turned out to be ghosts.

Results found that the war of the ghosts story had dramatically changed by the time it reached the final student. Students were found to have altered the story to make it fit into their own experiences and culture. For example, instead of canoes, students recalled the mode of transport being cars and the weapons were recalled as guns instead of bow and arrows.

Bartlett concluded that memory was not accurate recordings of events but constructed and reconstructed to fit in with the individual's own experiences. He believed individuals needed to impose meaning on something they did not understand and based this on their own understanding, experiences, hopes and fears.

Key findings:

- Details such as ghosts were omitted.
- The story was recalled more logically and shaped to fit together better than the original.
- Details were changed to more familiar concepts to the person; for example, canoes were changed to cars, bows and arrows changed to guns.
- The ordering of the story was also changed.

Strengths

- Results appear to support the reconstructive explanations of memory which suggests memory is altered to fit in with individuals rather than a recording of events.
- The model also explains everyday aspects of our memory and why we may have "failures" and why we do not accurately recall everything as they occur.
- This study helps us understand why people may remember events incorrectly as it may be down to errors in reconstruction rather than wilful attempts to mislead or malfunctions in processing.

Weaknesses

- The study and findings may lack validity as students may have consciously change the story or intentionally change it due to demand characteristics and wanting to make the story more entertaining.
- The story may have simply been misheard as it was being told to them suggesting this may not be sufficient enough evidence for the reconstructive memory having validity as an explanation.
- The reconstructive memory model makes predicting behaviour difficult and a good explanation for memory should make prediction possible for it to have credibility.
- The reconstructive model of memory does not predict how experiences or emotions can affect memories but simply gives principles of how reconstruction may work.

Effort After Meaning

Bartlett's war of the ghosts story demonstrated that memory was not an accurate recording of what was happening. He believed that memory was an active process that involved "effort after meaning" which means people try to make sense of something they are unfamiliar with after it has happened into things we already know and understand about how the world works.

Due to this process, Bartlett believed we often change our memories into versions that are more sensible to us and this involves us making assumptions or guesses on what has or should have happened. This may result in us mistakenly remembering things that are not true or create false memories because they make sense within the situation.

How Interference Affects Memory

There are two types of interference that can occur which can affect memory:

1. One way in which memory can be affected is through **proactive interference.**
2. Another way memory can be altered is through **retroactive interference.**

1. **Proactive interference** is when an old memory interferes with something a person is trying to remember now. Things we already know can cause problems for us as we try to take on new information. A good example of this is knowing your old postcode but struggling to remember your new one.

2. **Retroactive interference** is when a new memory interferes with old memories. New things we learn can cause problems for us when we try to recall information that we had learnt before. For example, you may be able to remember your new postcode but you struggle to remember your old one.

False Memories

Research has shown that false memories can affect recollection. False memories are when we remember something that hasn't actually happened.

One research study saw participants questioned about their childhood using information from their parents to describe a true event that occurred as well as a false event. The false event was them getting lost in a shopping centre when young. The results found 25% of participants believed the false memory thinking they had actually become lost and recalled details about what had happened to them while lost.

Research by psychologist Elizabeth Loftus and eyewitness testimony has also shown that false memories can easily be planted into people.

Context

Context is believed to be another factor that affects the accuracy of memory. For example, you find yourself at the top of the stairs only to forget why you have decided to come up. You may also enter a room only to forget why you were there in the first place.

This explanation proposes that returning to the context i.e. the place where you originally had the idea can help rekindle the memory for why you were going there.

Researchers believe that when we encode information we may also encode the things around us as part of the memory itself such as the sights, sounds, smells and textures etc. Each encoded memory is then associated with different elements of context and when we are put back in that context, those associations are recreated and they stimulate different elements of the memory aiding in recall.

1) Name the 3 different types of memory

1.

2.

3.

2) Define what each type of memory is believed to do:

1.

2.

3

3) Name the 3 different types of encoding:

1.

2.

3.

4) Define/explain/outline features of these 3 memory stores:

1.

2.

3.

5) Explain 4 strengths of the Multi-Store Memory Model:

1.

2.

3.

4.

6) Explain 4 Weaknesses of the Multi-Store Memory Model:

1.

2.

3.

4.

7) What is the Primacy effect?

8) What is the Recency effect?

9) Define/explain each type of retrieval and how it works

1.

2.

3.

10) <u>**Outline**</u> Murdock's Serial Position Curve Study

11) Evaluate **Strengths** For Murdock's Serial Position Curve Study

12) Evaluate **Weaknesses** For Murdock's Serial Position Curve Study

13) **Outline** Bartlett's Theory of Reconstructive Memory

14) **Outline** Bartlett's War of the Ghost Study

15) Evaluate **Strengths** For Bartlett's Theory of Reconstructive Memory

16) Evaluate **Weaknesses** For Bartlett's Theory of Reconstructive Memory

17) What does 'effort after meaning' refer to?

18) What are the two types of interference that can occur?

1.

2.

19) What are false memories?

20) How can false memories affect memory?

21) Describe/Explain how the two types of interference occur

1.

2.

22) How can context affect accuracy of recall?

23) How can someone use context to improve recall?

Below we have collated all the past questions that have come up for the memory topic for AQA GCSE Psychology. This provides an extensive resource bank of questions to draw upon to help practice for the actual exams.

May 2019 Exam Paper

Ben can list all of the planets in our solar system. What type of memory does Ben use to recall his list of planets? [1 mark]

A) Episodic

B) Procedural

C) Reconstructive

D) Semantic

Which **two** of the following statements about the multi-store model of memory are correct?
[2 marks]

A) All memory stores usually encode information acoustically

B) Approximately seven pieces of information can be stored in short term memory

C) Information flows through sensory, short term and long term memory stores

D) Information is transferred from sensory to short term memory through rehearsal

E) Sensory memory can store information for up to one minute

Samir is in his bedroom packing a suitcase to go on holiday to Spain. He realises he has not packed his toothpaste. He goes to the bathroom but when he gets there, he forgets what he needs.

Explain how context can affect the accuracy of memory. Refer to Samir's experience in your answer [4 marks]

At home, Samir drives on the left hand side of the road. Samir hires a car in Spain where people drive on the right hand side of the road. He finds he keeps driving towards the left hand side of the road instead of staying on the right.

Use your knowledge of interference to explain Samir's behaviour [2 marks]

Evaluate the theory of reconstructive memory [5 marks]

Describe Murdock's Serial Position Curve Study.

Evaluate the research method used in this study [9 marks]

Which is the best example of information that would be stored as procedural memory? Pick **one**

a) How many millilitres there are in a litre

b) How to play a piece of music on the piano.

c) The colours used in the Italian flag.

d) What happened on your first day at secondary school.

[1 mark]

Which of the following statements about short-term memory (STM) is true? Pick **one**

a) STM can hold information for up to 30 seconds.

b) STM can store approximately 15 pieces of information.

c) STM transfers information to long-term memory through attention.

d) STM usually encodes information semantically

[1 mark]

Evaluate the multi-store model of memory

[5 marks]

Describe Bartlett's box 'War of the Ghosts' study.

[4 marks]

Read the following information.

A police officer is reading the statements of two eyewitnesses. Both statements describe the same robbery committed by one person in a local shop. The first eyewitness described the robber as being a male, in his late teens, wearing a red hoodie and not carrying a weapon. The second eyewitness described the robber as being a male with a facial scar, in his late-twenties, wearing a red T-shirt and carrying a knife.

Use your knowledge of the theory of reconstructive memory to explain why each eyewitness gave different descriptions of the same robber.

[6 marks]

Explain one weakness of the reconstructive theory of memory.

[2 marks]

You have been asked to investigate the effect of context on the accuracy of memory.

Describe how you would design an experiment to do this

You would need to include the following information in your answer:

• **what you would ask participants to do and what data you would collect**

• **one extraneous variable that could affect your results and how you could control it**

• **the results you would expect to find from your experiment.**

[6 marks]

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