UNIVERSITY OF DJILALI BOUNAMA KHEMIS MILIANA

Level :2nd year Counseling & Guidance **Prof :D.MEZAINI**

Subject :English **Second Semester 2023**

Learning Objectives :

- Processes of memory: encoding (input), storage and retrieval (output).
- How memories are encoded and stored.
- Processes of memory: How memories are encoded.
- Processes of memory: Different types of memory;episodic memory, semantic memory and procedural memory.

LESSON ONE : Processes of memory:

Encoding, storage and retrieval

Memory is the storing of information over time. Memory, like learning, is a *hypothetical construct* denoting three distinguishable but interrelated processes:
1-**Encoding** - placing information into memory.2-**Storage** - retaining information in memory.3-**Retrieval** - recovering information from memory.

Encode – store – retrieve
'Memory' describes a whole lot of different things: remembering your last birthday, remembering the capital of France, remembering what you did in your last maths lesson, remembering stuff for exams, remembering where you put that necklace, remembering how to ride a bicycle …
In all cases, we can describe the process in terms of:
1. *Encoding*: the information must be translated into a form so that it can be held in your brain.
2. *Storage*: the information is then kept in your brain for a period of time – possibly even a lifetime.
3. *Retrieval*: the information has to be located and brought back out of your brain.
You can retrieve memories in several different ways:
• *Recognition* – for example, doing multiple choice questions, you are given four possible answers and have to decide which one is the right answer. Or seeing someone and being able to identify who they are – which is different from trying to recall what someone looks like.
• *Cued recall* – you try to remember a piece of information … it's on the tip of your tongue … and then someone gives you a clue or cue (*It begins with the letter 'B'*) and you can remember it.
• *Free recall* is when you retrieve it without cues.

Encoding

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 formof the information is changed.

Visual encoding

Some memories are stored visually. For example, if I 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 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 memory for smells.

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LESSON TWO :Processes of memory: **A study of encoding**

A study of encoding

Alan Baddeley (1966) conducted one of the best-known studies of **encoding** in memory. Psychologists distinguish between **short-term memories** (STMs) and **longterm memories** (LTMs) – sometimes we store information but only rather briefly; for example, if you are phoning someone up you remember their phone number while dialing it but then the number is forgotten. This is an example of short-term memories.

Long-term memories are those which last longer, in other words, you can retrieve them later on, after hours or days or even years.

Baddely's study: Aim

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

List « A »	List « B »	List « C »	List « D »
cat, cab, can, cad, cap, mad, max, mat, man, map	pit, few, cow, pen, sup, bar, day, hot, rig, bun	great, large, big, huge, broad, long, tall, fat, wide, high	good, huge, hot, safe, thin, deep, strong, foul, old, late

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

Baddeley 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 words are encoded *acoustically* because those were the words that got muddled up so they must have been thinking in terms of the sounds of the words. This applies to short-term memory (STM) because they were asked to recall the list immediately.

List C has semantically similar words (they have a similar meaning) whereas list D has semantically dissimilar words (they don't mean the same thing).
The fact that participants did worse with list C than list D suggests that information is encoded *semantically* if it isn't recalled immediately. This applies to long-term memory (LTM) because these lists were recalled after 20 minutes.

Acoustic coding is preferred in STM **and** Baddeley (1966) found that lists of words that sound similar (e.g.mad, map etc.) are harder to remember than lists of words that sound dissimilar (e.g. big, large etc.) even though they have similar meanings.

Semantic encoding is important in LTM. The more meaningful information is, the better it is stored in LTM. Baddeley found that similarity of meaning caused confusion when participants tried to recall words from LTM but that acoustic similarity of words did not interfere with their recall from LTM (though you will remember that this did impair recall from STM). Overall this suggests that short-term memories are encoded acoustically and longer-term memories are encoded semantically.

Study tip

Describing a research study

If you have a closer look at the research studies examples stated above, you can see that they have been divided into aims, methods, results and conclusions. This is one way to examine a research study in detail.
Aim – this tells us what the researcher was trying to investigate.
Method – a description of what the researcher actually did, so anyone can repeat the study if they want to check the results.
Results – gives us details of what data was produced in the study. A graph provides an easy way to 'eyeball' the data.
Conclusions – an analysis of the results to consider the implications of the study.

Evaluation

A controlled experiment
Point: One strength is this is a well-controlled experiment which enhances the validity of the results.
Explanation: The study was conducted within a lab where conditions could be carefully controlled so that no other factors would influence participant's ability to recall the lists.
One important factor that was controlled was poor hearing, which could be an extraneous variable. If participants had poor hearing they might be less likely to hear similarity in words. Baddeley did give participants a hearing test.
The level of control means we can be more confident that the results are due to changes in the independent variable (acoustic or semantic similarity/dissimilarity).
STM may sometimes be visual
Point: One weakness is that Baddeley overlooked cases where encoding in STM is visual

rather than acoustic.

Explanation: Baddeley used quite artificial stimuli (word lists). If different stimuli were used STM may not always be acoustic. In another study Brandimote *et al.* (1992) found that participants used visual encoding in STM when processing visual information. Normally we 'translate'visual images into verbal codes in STM, but this may not always be the case – especially if verbal rehearsal is prevented.

This means that STM is not always acoustic.

***EXTRA*: Was it LTM?**

Point: Another weakness is that Baddeley may not have been testing LTM at all.

Explanation: In the study LTM was tested by waiting for just 20 minutes. There are many things that we remember for 20 minutes but have forgotten by the next day, so recall after 20 minutes may not really be LTM.

Therefore Baddeley may not have actually been testing what he claimed to be testing.

LESSON THREE :Processes of memory:

Different types of memory

Long-term memory (LTM)

If I tell you my phone number will you still remember it in an hour? Tomorrow? Next week? Next year? We remember some things for only a short time and these are called *short-term memories*. There is no exact time when something becomes a *long-term memory* but, in general, short-term memories are ones that disappear within a few hours or days. Long-term memories, as the name suggests, stay with us for weeks, months and even a life-time. Endel Tulving (1985) was one of the first cognitive psychologists to realise that the **multi-store model's** view of **LTM** was too simplistic and inflexible. Tulving proposed that there are in fact three LTM stores, containing quite different types of information.He called them **episodic memory**, **semantic memory** and **procedural memory**.

1. Episodic memory

Episodic memory refers to our ability to recall events (episodes) from our lives. This has been likened to a diary, a record of daily happenings. Some examples are: your most recent visit to the dentist, a gig you went to last week, the psychology class you had yesterday, the breakfast you ate this morning, and so on.

These memories are much more complex than you might think. First of all, they are 'time-stamped' – in other words you remember when they happened: recently or last week or this morning.

Secondly, your memory of a single episode will include several elements, such as people and places, objects and behaviours, and all of them are interwoven to produce a single memory. Thirdly, you have to make a conscious effort to recall episodic memories. You may be able to do so quickly, but you are still aware that you are searching for your memory of what happened when you went to the dentist

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 don't usually remember when we first learned about something, 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 (eventually) 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 even 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 need to remember the terms declarative 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.

Evaluation

Specific locations in the brain

Point: One strength of dividing LTM into different types is that brain scans have shown separate locations in the brain for each of the three types of memory, supporting the idea of different kinds of memory.

Explanation: If the three types of memory are different then each should have a specific location in the brain.

Researchers have found support for this, for example:

• Episodic memory is associated with the right prefrontal area.

• Semantic memory is associated with the left prefrontal area.

• Procedural memory is associated with the motor area which controls fine motor skills.

Amnesic patients

Point: Another strength is that people who suffer from loss of memory due to brain damage lose only certain kinds of memory.

Explanation: Another famous case of amnesia happened to a man known as HM who had severe epilepsy as a young boy. An operation to remove his hippocampus (to reduce epilepsy from that area) resulted in a catastrophic loss of memory – but not all his memory. He could recall how to do things but was unable to remember events from his past.

This again shows that there are different kinds of memory.

***EXTRA*: It's not as simple as it seems**

Point: One weakness is that, in reality, there isn't a clear difference between episodic and semantic memories (you may already have realised this).

Explanation: Amnesic patients actually retain some of their semantic memories, such as language (you use your semantic memory to recall the vocabulary of any language). And most of our memories are a fusion of episodic and semantic ones. For example, your knowledge (semantic memory) of Justin Bieber is closely linked to your experiences of seeing him sing (episodic memories).

Therefore the idea of three stores may be just too neat and tidy to be true. It is an oversimplification.

Basic Memory Processes

Encoding	**Storage**	**Retrieval**
Code and put into memory	Maintain in memory	Recover from memory

Types of memory codes • Acoustic • Semantic • Visual	**Types of longterm memory** • Episodic • Procedural • Semantic	**Types of retrieval** • Cued recall • Free recall • Recognition

Summary

Processes of memory

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

Encoding	**A study of encoding**	Different types of LTM
Encoding Changing information into a form so it can be held in the brain	Baddeley's study: Aim To see if there was a difference in the type of encoding used in STM and LTM.	**Episodic memory** Memory for events from your life.
Visual encoding Changing information by how it looks so it can be stored.	Method Participants learned words similar or dissimilar sounding (e.g. cat, cab, can, or pit, few, cow). Immediate recall. Learned words with similar or dissimilar meanings. Recall after 20 minutes	**Semantic memory** Memory of what things mean (your own encyclopedia).
Acoustic encoding Changing information by how it sounds so it can be stored.	Results Similar sounding words poorly recalled in STM, words with similar meanings (e.g. great, large, big, or good, huge, hot) poorly recalled in LTM.	**Procedural memory** Memory of how to do things.
Semantic encoding Changing information by its meaning so it can be stored.	Conclusion This shows STM is encoded by sound and LTM by meaning.	Declarative and non-declarative Declarative = episodic and semantic.
Other encoding Tactile encoding: memory of what things feel like to touch. Olfactory encoding: memory for smell.		
Storage	Evaluation	Evaluation
Storage Holding information in memory so that it can be retrieved later.	Controlled experiment It is well controlled as extraneous variables like participants' hearing were controlled by a hearing test.	Specific locations in the brain Brain scans show different types of LTM relate to different brain locations e.g. procedural memory associated with motor area.
Retrieval Retrieval Locating and bringing back information into mind .	STM is sometimes visual Encoding in STM does not always involve sound (Brandimote et al.).	Amnesic patients Amnesiacs like Clive Wearing support LTM types as most of his procedural but not episodic memories were intact.
Types of retrieval 1. Recognition = identifying from options. 2. Cued recall = locating information with a clue. 3. Free recall = without cues.	Extra: LTM may not have been tested LTM may not be tested as they only waited 20 minutes before recall, so conclusion lacks validity.	Extra: It's not that simple Distinctive types of LTM are difficult to separate so it may be an oversimplification.

Check yourself

SECTION A :

Say whether the following statements are true or false

N	Statements	T/F
1	Encoding is about how we get information out of memory.	
2	There are just two main types of encoding.	
3	Cued recall is a type of retrieval.	
4	Picturing your house in your mind means you are using visual encoding.	
5	Semantic encoding refers to the meaning of something (such as words).	
6	Being able to use the word 'elephant' so it makes sense in a sentence is semantic encoding.	
7	Tactile encoding concerns our memories of smells.	
8	Storage of information comes before encoding.	
9	Free recall involves identifying something previously learned from different options.	

SECTION B — Multiple-choice questions

Choose the response that is **correct** or that **best answers** the question.

Marks will **not** be deducted for incorrect answers.

No marks will be given if more than one answer is completed for any question.

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

5. 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) Where memory is in the brain.

6. Which of the following is an acoustically similar word list?

(a) Pit, few, cow. (b) Great, large, big. (c) Good, huge, hot. (d) Cat, cab, can.

7. In Baddeley's study, the type of encoding used in STM was:

(a) Visual. (b) Semantic. (c) Tactile. (d) Acoustic.

8. 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.

9. The three types of LTM are:
(a) Episodic, acoustic, semantic. (b) Visual, semantic, procedural.
(c) Recognition, acoustic, episodic. (d) Episodic, semantic, procedural.

10. Remembering how to perform actions is an example of:
(a) Episodic memory. (b) Procedural memory.
(c) Semantic memory. (d) Declarative memory.

11. In brain scans, which part of the brain is associated with semantic memory?
(a) Left prefrontal cortex. (b) Right prefrontal cortex.
(c) Premotor area. (d) Motor cortex.

12. Which part of HM's brain was removed?
(a) Prefrontal cortex. (b) Hippocampus. (c) Motor cortex. (d) Hypothalamus.

SECTION C :

1-Describe a study that investigated how memories are encoded.
Below are some sentences that will help you answer the question above.Unfortunately, the sentences have become jumbled up and are in the wrong order. Put the appropriate number under the corresponding heading in the table below.An example is given.

1	In group C, the participants had words with similar meanings.	8	Baddeley used four groups of participants.
2	He gave them 12 sets of five words to remember.	9	Group A was given words that sounded similar.
3	The participants in Group D were given words with dissimilar meanings.	10	Group C recalled fewer words than Group D.
4	Baddeley claimed that the results showed that STM is encoded by sound (acoustically) and LTM by meaning (semantically).	11	Alan Baddeley (1966) wanted to see if there were any differences in the encoding used in STM and LTM.
5	Group B had words that sounded dissimilar.	12	Baddeley found that Group A recalled fewer words than Group B.
6	In LTM words with similar meanings were more poorly recalled than words with different meanings.	13	Participants in Groups A and B had to recall their words straightaway – this tested STM.
7	In STM similar sounding words were more poorly recalled than words with different sounds.	14	Groups C and D recalled their words after 20 minutes – ***this tested LTM.***

Write down the right order in the boxes below so that the answer makes sense.			
Aim	**Method**	**Results**	**Conclusion**
	8,	12,	

2- Use the words belown to fill in the blanks

Controlled strength STM recall LTM validity laboratory test read sound words variables

A strength of Baddeley's research is that it is a ….1……..study where extraneous ……2……..were well……3……. For example, he controlled hearing ability by giving participants a hearing ……....4……., which was important because the words were……5…… out. This is a……6….because we can be more certain that the type of …..7….used was the factor that affected participants' recall.
A weakness of the study is that encoding in **……8…..** does not always involve……9…….. Another weakness is that …….10……may not have been tested in the study.The participants had to wait 20 minutes before……....11….but this doesn't mean the words were in LTM. This is a weakness because it could mean the conclusion that LTM encoding is semantic lacks…….12….

LESSON FOUR : Structures of memory

The multi-store model

Learning Objectives :

- Structures of memory: The multi-store model of memory; sensory, short term and long term.
- Features of each store: coding, capacity, duration.
- Structures of memory: Primary and recency effects in recall; the effects of serial position.

Murdock's serial position curve study

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.

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 your eyes or ears or fingertips or nose. These memories are coded (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, this 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. For example, if you tested your memory for 5 digits after 30 seconds you wouldn't remember them – unless you had rehearsed them. 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 in 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 weeding out unneeded information so that we do always appear to have more room.

• *Duration* is potentially up to a lifetime.

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 found that we tend to mix up words that sound similar when we are using our STMs. But we mix up words that have similar *meanings* when we use our LTMs.

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.

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

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 multistore model originally proposed.

***EXTRA*: Artificial materials**

Point: Another weakness is that research studies in the 1950s and 60s 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.

LESSON FIVE :Structures of memory (Cont)

Primacy and recency effects in recall

Murdock's serial position curve study

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

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 differentwords. 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 found that the likelihood of recall was related to the position of the word in the list. 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** because primacy means 'first'.

• Highest recall for the final few words on the list. This is called a **recency effect** because these words were most recent.

Conclusions

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.

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 the:

• Independent variable (IV) was the position of a word in the list.

• Dependent variable (DV) was the probability that the word was recalled.

The researcher controlled the familiarity of the words, the speed they were read at and ensured that practice had no effect on performance (the participants might have got better at recalling lists the more they did it). Therefore, none of these things would have affected the DV.

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. So this way of studying memory is really rather artificial. It does relate to some aspects of life (like learning for an exam) but not to many other aspects of life.
***EXTRA*: Supporting research**
Point: One strength of this study is research with amnesiacs 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 but they do show a recency effect (Carlesimo *et al*. 1996).
This confirms that the primacy effect is related to long-term memory.

Summary

Structure of memory

Multi-store model of memory	Primacy and recency effects in recall
Multi-store model Three memory stores: different coding, capacity and duration. Information moves through attention and verbal rehearsal.	**Primacy and recency effect** Words at beginning are remembered more (rehearsed, so in LTM). Words at end are remembered more (heard recently, so in STM).
Sensory memory Very short duration, large capacity. Attention transfers information to STM.	**Murdock's study: Aim** To see if memory of words is affected location in a list.
STM Limited duration (30 seconds) and capacity (5–9 items), acoustic coding.	**Method** Participants listened to 20 word lists with 10–40 words on them, recalled words after each list.
Role of rehearsal Rehearsal keeps information in STM. Repeat rehearsal transfers STM into LTM.	**Results** Recall related to position of words. Higher recall for the first words (primacy effect) and last words (recency effect) than in middle.
LTM Semantic coding, unlimited capacity and stored up to a lifetime.	**Conclusion** Shows the serial position effect and supports the MSM stores
Evaluation	Evaluation
Supporting research Encoding research (Baddeley) shows qualitative differences between STM and LTM.	Controlled lab study There was a high level of control so it could be concluded position of words determined recall.
Simple model Having one STM and LTM store is too simplistic, e.g. more than one LTM store.	Artificial task Word lists were used which is only one type of memory, so the study lacks validity.
Extra: Artificial materials Research uses word lists or nonsense syllables so the model lacks validity.	Extra: Supporting research Some amnesiacs can't store LTM, which shows the primacy effect is related to LTM (Carlesimo et al).

Check yourself

SECTION A :

Read the sentences below about the study by Murdock. Indicate whether each is true or false.

N	Statements	True/False
1	Murdock's aim was to support the multi-store model.	
2	Murdock's words were drawn from 4000 common words in English.	
3	Murdock chose every 10th word from thedictionary.	
4	Each participant read 10 word lists.	
5	Each list had between 10 and 40 words on it.	
6	The participants recalled the lists after 20 minutes.	
7	Murdock found a primacy effect because recall of the last few words on each list was relatively high.	
8	Murdock's fi ndings demonstrated the serial position effect.	
9	Unfortunately, Murdock's fi ndings do not support the multi-store model.	
10	The first few words on each list are rehearsed, so are contained in LTM.	

SECTION B — Multiple-choice questions

Choose the response that is **correct** or that **best answers** the question.

Structures of memory:

Multi-store model of memory

1. Coding is mostly acoustic and capacity is between five and nine items. Which memory store is being described?

(a) Short-term memory. (b) Sensory memory. (c) Visual memory. (d) Declarative memory.

2. An example of sensory memory in action is:

(a) Recognising a friend in the street.

(b) Repeating someone's phone number to yourself.

(c) Seeing your name written in the air with a sparkler.

(d) Remembering the answer to an exam question.

3. Information gets into LTM through:

(a) Attention. (b) Declarative memory. (c) Rehearsal. (d) Visual encoding.

4. An important weakness of the multi-store model is:

(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) There is no evidence to support it.

Structures of memory:

Primacy and recency effects in recall

5. The dependent variable in Murdock's study was the:

(a) Position of a word in the list.

(b) Probability of a word being correctly recalled.

(c) Total number of words correctly recalled.
(d) Primacy and recency effects.

6. Being able to recall the words at the start of a list refers to the:
(a) Recency effect. (b) Primacy effect. (c) Serial position curve.
(d) Dependent variable of the study.

7. How does Murdock's study support the multistore model?
(a) Primacy effect shows LTM and recency effect shows STM.
(b) Primacy effect shows STM and recency effect shows LTM.
(c) The serial position curve involves sensory memory.
(d) It doesn't support the multi-store model.

8. Murdock used lists of words, which means that the study:
(a) Was a laboratory experiment.
(b) Was not very well controlled.
(c) Tested a wide range of memory skills.
(d) It only tells us about some of the ways that memory is used in everyday life.

LESSON SIX :Memory as an active process

Bartlett's War of the Ghosts study

- **Learning Objectives :**
- Memory as an active process: Bartlett's War of the Ghosts study
- Memory as an active process: The Theory of Reconstructive Memory, including the concept of 'effort after meaning'
- Background to the studies.
- Aims, procedures, results and conclusions.
- Strengths and weaknesses of the studies.

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 recollection 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 expectations and make the story more familiar over time. Such expectations are based on social and **cultural** knowledge.

Aim

To investigate how memory is reconstructed when people are asked to recall something repeatedly over a period of weeks and months.

Bartlett's aim was to use a story from a different culture to see how cultural expectations affect memory

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 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 his 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 story and that they interpreted the story within their own frames of reference (social and cultural expectations), changing the facts to make them fit. Bartlett made several observations about the transformations that occurred:

• The story was shortened, mainly by omissions.

• The phrases used were changed to language and concepts from the participant's 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 memory for the event.

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 (Gauld and Stephenson1967). 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 counted as 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 quite everyday experiences. 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.

LESSON SEVEN :Memory as an active process

The theory of reconstructive memory

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 it 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 recombine 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 left, the way participants remembered the picture was influenced by what they expected to be true – that a black person is more likely to be the attacker.

In the War of the Ghosts study, people transformed those parts of the story that didn't fit their own cultural expectations; for example, in the actual story the young men were hunting seals – this was often misremembered as going fishing, a more common activity for British young men.

Social/cultural expectations may influence storage and/or recall. Bartlett called his work 'the social 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'.

Evaluation

More realistic research

Point: One strength is that Bartlett's way of investigating memory reflects how we actually use memory in our everyday lives, 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 rarely 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 inaccurate or affected by social expectations.

Explanation: Other studies have shown that memory can be very accurate. For example, in situations that are personally important or distinctive, we do remember considerable and accurate detail. There are examples of this in the War of the Ghosts – participants often recalled 'Something black came out of his mouth' because it was quite a distinctive phrase. This shows that people do not always actively reconstruct memories and shows that some memories are accurate.

Real-world application

Point: Another strength of this theory is that it can explain problems with eyewitness testimony.

Explanation: Eyewitness testimony used to be regarded as very important and reliable evidence in court cases. Such testimony was relied on to give an accurate picture of what actually happened when a crime was committed. For example, an eyewitness might swear on oath that they had seen a particular person present at the crime scene whereas later evidence challenged this.

Bartlett's research showed that memory isn't always accurate and can be affected by our expectations of what happened. Research on eyewitness testimony has subsequently shown that people do not always recall what they see or hear accurately This shows that Bartlett's research has had important consequences.

22Summary

Memory as an active process

Bartlett's War of the Ghosts study	The theory of reconstructive memory
Bartlett's study: Aim To see how memory is reconstructed when recalling an unfamiliar story.	The theory People rebuild memory as an active process.
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.	Memory is inaccurate Memory is not a process of exact reproduction of experiences.
Results Participants changed the story to fit cultural expectations, leaving out unfamiliar information.	Reconstruction Record pieces of information, recombine to tell the whole story.
Conclusions We use our knowledge of social situations to reconstruct memory.	Social and cultural influences Expectations come from the world/culture we live in, and affect storage and recall.
Evaluation	Effort after meaning We focus on the meaning of events and make an effort afterwards to make sense of fragments of memory.
Lacks control Participants were not told accurate recall was important, which could have affected results.	**Evaluation**
Results were biased Bartlett analysed the recollections himself, so we cannot fully trust the conclusion.	More realistic research Reflects how we use memory in everyday life because it uses a story not word lists.
Extra: Story was unusual The story was unusual so may not reflect everyday memory processes.	Some memories are accurate Not all recall is reconstructed as some memories of the story are accurate.
Lacks control Participants were not told accurate recall was important, which could have affected results.	Extra: Real-world application It explains problems with eyewitness testimony as people do not always recall accurately.

Check yourself

Multiple-choice questions

Choose the response that is **correct** or that **best answers** the question.

Memory as an active process:
Bartlett's War of the Ghosts study

1. Bartlett believed that memory is:

(a) Acoustic. (b) Procedural. (c) Reconstructive. (d) Declarative.

2. The participants in Bartlett's study transformed the story to make it:

(a) Interesting. (b) More complex. (c) More familiar. (d) Longer.

3. Bartlett used the method of:
(a) Recognition. (b) Serial position effect. (c) Cued recall. (d) Serial reproductions.
4. Bartlett concluded that we remember:
(a) Lots of detail of an event or story.
(b) The overall meaning of something.
(c) The start and end of a story better than the middle.
(d) All aspects of a story equally well.

Memory as an active process:
The theory of reconstructive memory

5. Reconstruction shows that memory is:
(a) Consistent over time.
(b) Almost always accurate.
(c) Acoustically encoded.
(d) An active process.
6. A major influence on reconstructive memory is:
(a) The time it takes to recall something.
(b) Our level of intelligence.
(c) Our social and cultural expectations.
(d) The position of events in a story.
7. 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.
8. A significant strength of Bartlett's theory is that it:
(a) Ignores the individual's social and cultural beliefs.
(b) Can explain why memories are so accurate.
(c) Is based on well-controlled research.
(d) Can help us understand eyewitness testimony.

LESSON EIGHT :Factors affecting the accuracy of memory

- **Learning Objectives :**
- Factors affecting the accuracy of memory,including interference.
- Factors affecting the accuracy of memory, including context.
- Factors affecting the accuracy of memory,including false memories
- Background to the studies.
- Aims, procedures, results and conclusions.
- Strengths and weaknesses of the studies.

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**. At least some forgetting takes place because of **interference**. This occurs when two pieces of information con ict with each other, resulting in forgetting of one or both, or in some distortion of memory.

Interference has been proposed mainly as an explanation for forgetting in **longterm memory (LTM)**. Once information has reached LTM it is more-or-less permanent.

Therefore, any forgetting of LTMs is most likely because we can't get *access* to them even though they are *available*. Interference between memories makes it harder for us to locate them, and this is experienced as 'forgetting'.

Types of interference

It is very likely that the two (or more) memories that are interfering with each other were stored at different times. So psychologists recognise that there are two types of interference:

• **Proactive interference** (PI) occurs when an older memory interferes with a newer one (*pro* in this context means working *forwards*, from old to new). For example, your teacher has learned so many names in the past that she has difficulty remembering the names of her current class.

• **Retroactive interference** (RI) happens when a newer memory interferes with an older one (*retro* meaning working *backwards*). For example, your teacher has learned so many new names this year that she has dif- culty remembering the names of the students last year 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 (1931).

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

McGeoch and McDonald studied retroactive interference by changing the amount of similarity between two sets of materials. 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 rested.

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 material (synonyms) produced the least accurate recall.

Conclusion

The results show that interference is strongest when an intervening activity is similar. The most similar material (synonyms) produced the worst recall. In other words forgetting is more likely to happen if you try 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 worst with synonyms and best with no new list.

To control for the effect of order they gave the participants the lists in different orders – 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 does 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 effects are just temporary and that information is not actually forgotten. If participants are given a cued recall test (given pointers to aid recall) they recall many of the items that were apparently forgotten (Tulving and Psotka 1971). This shows that the information is stored in memory but simply not accessible.

LESSON NINE :Factors affecting the accuracy of memory

Context

Certain triggers (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 trawl 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 does improve recall?

Method

Eighteen participants were recruited who were all members of a diving club. The divers had to listen to a list of 36 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 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 contexts of learning and recall matched, whereas in the other two they did not. Groups 1 and 4 are matching – the environments where the words were learned might trigger their recall. For groups 3 and 4 the context could not act as a cue.

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.

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 context 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 really 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.

LESSON TEN : Factors affecting the accuracy of memory

False memories

You have already learned about reconstructive memories and how this can be applied to eyewitness testimony – people who are witness to a crime do not record the scene passively but are likely to reconstruct what happened based on fragments of what they remember and, most importantly, their expectations.

Elizabeth Loftus has been one of the most vocal psychologists in questioning the accuracy of eyewitness recall.

Loftus argues that eyewitnesses reconstruct their memories but the same may happen during therapy – when people seek help with psychological problems.

Some therapists aim to 'recover' memories in their patients – in other words they help their patients remember things that the patient had forgotten. In some cases, these 'recovered memories' turn out to be false.

Elizabeth Loftus and Jacqueline Pickrell (1995) investigated such **false memories** in a study which is referred to as the 'Lost in the Mall' study.

Loftus and Pickrell's study: Aim

Can we form a memory of something that never happened?

The aim of this study was to see if false memories could be created in participants through suggestion in order to test the existence of repressed and false memories.

Method

The study included 24 participants (3 males and 21 females) ranging in age from 18 to 53. For each participant, a relative was also contacted.

The participants were given four short stories about childhood events that had been obtained from their relatives. Three of the stories were true and one was false.

The false story was about getting lost in a shopping mall in their childhood and being rescued by an elderly woman. The false story was crafted from information given by the relative (e.g. the relative said what the child's favourite store was, who usually went on shopping trips with the child, etc.). This meant that the false story sounded realistic.

Each participant was asked to read each story and then write down what they remembered about each event.

A week or two later each participant was interviewed about the stories and asked to recall as much as they could. Each participant was also interviewed a second time and then they were debriefed – they were told that one of the stories was false and asked to guess which one.

Results

In total there were 72 true episodes to be remembered and participants remembered 68% of these. Six of the participants (25%) recalled the false story fully or partially. One participant thought she recalled it and then changed her mind and the others had no memory of the false event.

19 out of the 24 participants correctly chose the lost in the mall memory as false.

Conclusions

This research suggests that the mere act of imagining an event has the potential of creating and implanting a false memory in a person.

This shows that false memories are an example of reduced accuracy in memory, based on the idea of reconstructive memory.

Evaluation

Artificial task

Point: One weakness of the study is that the false memory event (lost in a mall) is not of the same traumatic kind that might be recovered by a therapist.

Explanation:: 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.

Therefore, the conclusions that can be drawn from this study are limited.

Ethical issues

Point: Another weakness is that participants may be left with the implanted false memories.

Explanation: At the end of Loftus and Pickrell's study the participants were debriefed. They were told that the lost in the mall story was false.

However, it is possible that even knowing this,participants were still left with a lingering sense of it having happened.

This means that such research raises ethical issues of whether this research is of sufficient importance to manipulate people in this way.

***EXTRA*: Real-world application**

Point: 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 'Was there anything in his hand?'. Loftus has shown in many different studies that such questions can create false memories (e.g. Loftus and Palmer 1974).

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

Summary

Factors affecting the accuracy of memory

Interference	Context	False memories
McGeoch and McDonald's study: Aim To see the effect of doing two activities on accuracy of memory.	**Godden and Baddeley's study: Aim** To see if context improved recall.	**Loftus and Pickrell's study: Aim** To see if false memories could be created in participants through suggestion.
Method Learned a list of 10 words and then another list of varying types, e.g. synonyms and antonyms.	**Method** Divers listened to and recalled words in the same or different settings on the beach and underwater.	**Method** Four stories about childhood events were read where three were true and one was false (shopping mall).
Results Memory was affected by the second list, most of all if second list had similar meaning (synonyms).	**Results** Recall was highest in the same environment for learning and recall.	**Results** 6 out of 24 (25%) of participants recalled the false story fully or partially.
Conclusions	**Conclusions**	**Conclusions**

Shows interference affects accuracy of memory and is strongest when you try remember two similar things.	Context of learning acts as a trigger or cue,improving the accuracy of memory.	Imagining an event can implant a false memory in a person, reducing accuracy of memory.
Evaluation	Evaluation	Evaluation
Controlled research High control e.g. counterbalancing was used to reduce bias.	**Artificial task** Lists of words were used. When more complex materials were used, better recall was found.	**Artificial task** Harmless events could be implanted easily but traumatic events may not, so conclusions are limited.
Artificial task It does not reflect real-life memory as we don't often have to remember very similar words.	**Recall was short term** Participants recalled the words almost immediately,unlike in everyday life.	**Ethical issues** Participants may be left with implanted false memories which lingered after the study, causing distress.
Extra: Not really forgetting It may be information is not forgotten but just cannot be accessed, so isn't actually forgotten(Tulving and Psotka).	**Extra: Similar context** Context only acts as a cue if context at learning and recall are very similar, which rarely happens (Smith).	**Extra: Real-world application** Research has implications for eyewitness testimony as police questioning could accidentally implant false memories

Check yourself

SECTION A :

Indicate in the table, with a tick or a cross, whether the statements are true or false.

N	Statements	True/False
1	Loftus and Pickrell wanted to use suggestion to see if false memories could be implanted.	
2	The participants read five stories about recent events.	
3	Three of the stores were true.	
4	Two of the stories were false.	
5	Participants had to explain out loud what they remembered about each story.	
6	25% of the true stories were remembered.	
7	18 participants had no memory of the false story.	
8	The researchers concluded that it is impossible to implant a false memory.	

SECTION A — Multiple-choice questions

Choose the response that is **correct** or that **best answers** the question.

Factors affecting accuracy of memory:

Interference

1. Interference causes:

(a) Retrieval. (b) Memory capacity. (c) Forgetting. (d) Hunger

2. In the study by McGeoch and McDonald participants had to learn word lists which had how many words in them?

(a) 5 (b) 10 (c) 15 (d) 20

3. McGeoch and McDonald concluded that the factor making interference strongest is:
(a) Similarity.
(b) The number of words on the original list.
(c) The size of short-term memory.
(d) The number of items on the second list.
4. A criticism of interference is that the effect is just temporary and disappears if:
(a) Counterbalancing is used.
(b) The participants concentrate more.
(c) Recall is triggered by a cue.
(d) Experiments are better controlled.
5. Proactive interference occurs when:
(a) Newer memories cause forgetting of older ones.
(b) Memories fade over time.
(c) Older memories cause forgetting of newer ones.
(d) We don't have the right information to trigger our memory.
6. Which of the following situations makes interference less likely?
(a) When two instances of learning are similar.
(b) When two instances of learning are meaningful.
(c) When two instances of learning are different.
(d) When the time between two instances of learning is short.
7. Which of the following is the best example of retroactive interference?
(a) A student revises for her English exam, then her French exam and has trouble recalling her English.
(b) A student revises for her English exam, then her French exam and has trouble recalling her French.
(c) You have a new mobile phone number but keep telling people your old one.
(d) You accidentally call your new friend by your old one's name.

Factors affecting accuracy of memory:

Context

8. Godden and Baddeley studied:
(a) Fishermen. (b) Diving club members. (c) Rugby players. (d) Swimmers.
9. 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.
10. Godden and Baddeley concluded that environmental context is:
(a) A cue 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.
11. A serious weakness of Godden and Baddeley's study is:
(a) It doesn'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

12. 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.

13. 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%.

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

15. A weakness of Loftus and Pickrell's study is:
(a) It has applications in the real world.
(b) It raises ethical issues.
(c) It uses realistic materials.
(d) It investigates severely traumatic false memories.

SECTION C :

How much do you know about interference theory and McGeoch and McDonald's study? Find out by matching the first half of each sentence in the left-hand column with the second half in the right-hand column. Then put the sentences in the correct order.

1	When the participants recalled the first list of words ...	**A**	. … syllables.
2	After they learned the list ...	**B**	. … if the accuracy of recalling a list of words is affected by a competing set of words.
3	Another new list contained consonant ...	**C**	… a list of ten words.
4	McGeoch and McDonald aimed to fi nd out ...	**D**	… the participants were shown a new list.
5	When two memories interfere with each other ...	**E**	. … interference from a second set of information reduces the accuracy of memory.
6	Another conclusion was that interference is strongest when ...	**F**	. … one memory may prevent us from accessing the other memory.
7	Another list contained three-digit ...	**G**	. … new list.
8	Participants fi rst of all learned ...	**H**	. … numbers.
9	McGeoch and McDonald concluded that ...	**I**	. … their memories were affected by the new list.
10	One new list contained words with the same ...	**J**	. … the two sets of information are similar.
11	Some participants were shown no ...	**K**	… meanings as the first list.

UNIVERSITY OF DJILALI BOUNAMA KHEMIS MILIANA

Level :2nd year Counseling & Guidance **2nd Semester English**

Name :…… First name :…… Group :……

ANSWER SHEET

1- Processes of memory

SECTION A : Say whether the following statements are true or false.

1	2	3	4	5	6	7	8	9

SECTION B — Multiple-choice questions

1	2	3	4	5	6	7	8	9	10	11	12

SECTION C : 1- Put the appropriate number under the corresponding heading in the table below.

Write down the right order in the boxes below so that the answer makes sense.			
Aim	**Method**	**Results**	**Conclusion**
	8,	12,	

2- Use the words belown to fill in the blanks

1		**7**	
2		**8**	
3		**9**	
4		**10**	
5		**11**	
6		**12**	

2-Structures of memory

SECTION A :

Read the sentences below about the study by Murdock. Indicate whether each is true or false.

1	2	3	4	5	6	7	8	9	10

SECTION B — Multiple-choice questions

1	2	3	4	5	6	7	8

3- Memory as an active process

Multiple-choice questions

1	2	3	4	5	6	7	8

4- Factors affecting the accuracy of memory

SECTION A :

Indicate in the table whether the statements are true or false.

1	2	3	4	5	6	7	8

SECTION A — Multiple-choice questions

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	

SECTION C :

How much do you know about interference theory and McGeoch and McDonald's study?

1	2	3	4	5	6	7	8	9	10	11