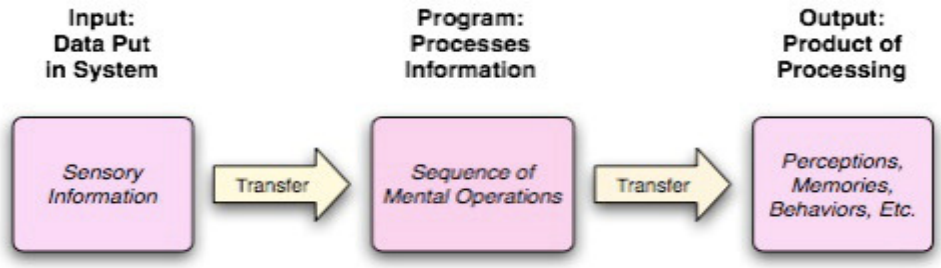
COGNITIVE APPROACH

The Cognitive Approach in Psychology became influential in the 1960s and '70s. Cognitive researchers began studying the processes of the mind rather than external human behaviour. To do this, they developed ingenious tests and carried out lab experiments to identify and manipulate perception and memory. The worked on the assumption that the human mind is an information processor, like a computer (this is called the "computer analogy") – information is inputted into the mind, processed, and then there is output in the form of memories, beliefs or decisions. This was termed the "Cognitive Revolution" in Psychology.



The Edexcel Specification expects you to be able to (AO1) know and understand, (AO2) apply, (AO3) analyse and evaluate the following:

- **Multi Store Model (Atkinson and Shiffrin, 1968**, p3**)**, including short- and long-term memory, and ideas about information processing, encoding, storage and retrieval, capacity and duration.
- Explanation of long-term memory – **episodic and semantic memory (Tulving, 1972**, p9**)**.
- **Working Memory model (Baddeley and Hitch, 1974**, p15**)**
- **Reconstructive Memory (Bartlett, 1932**, p21**)** including schema theory.
- **Individual differences in memory**
- **Classic study** (p28)**: Baddeley (1966b)** *Working memory model: The influence of acoustic and semantic similarity on long-term memory for word sequences.*
- **One contemporary study** (p34)**: Schmolck et al. (2002)** *Semantic knowledge in patient HM and other patients with bilateral medial and lateral temporal lobe lesions.*
- One **key question** (p40) of relevance to today's society, discussed as a contemporary issue for society rather than an as academic argument. Concepts, theories and/or research (as appropriate to the chosen key question) drawn from cognitive psychology as used in this specification. **Suitable example: How can psychologists' understanding of memory help patients with dementia?**

The Specification also expects you to study experiments, the Mann Whitney U-Test and the case study as methodological issues but these are detailed in another booklet

COGNITIVE THEORIES

There are four broad theories of memory which you are expected to understand, apply and evaluate:

- The **Multi Store Model (Atkinson & Shiffrin, 1968)**
- **Tulving's (1972)** theories about **episodic and semantic memory**
- The **Working Memory model (Baddeley & Hitch, 1974)**
- **Reconstructive Memory (Bartlett, 1932)**

To show **Knowledge & Understanding (AO1)**, you should be able to:

1. Explain the **context** of a theory: who came up with it and why? What were they basing their ideas on and why were these ideas important? You don't need to know the dates, but you should understand the *order* of the theories and how some of them build on others
2. Explain the **content** of a theory: what are the key terms and ideas? A lot of theories and models can be shown as diagrams or flowcharts. It's OK to copy these in the exam but you MUST explain them too. It's not an A-Level in drawing diagrams!
3. Explain the **research** into a theory: what experiments or case studies of unusual individuals were carried out to support this study?

To show **Application (AO2)**, you should be able to explain how this theory would explain real examples of people remembering or forgetting things – or famous examples of amnesia or diseases like Alzheimers.

To show **Analysis & Evaluation (AO3)**, you must discuss the strengths and weaknesses of the theory and how it compares to other theories. There is a code to help you remember how to do this: SWAC

1. **Strengths:** what research supports this theory? This includes experiments and case studies or events in real life. Don't just *describe* the support: explain *why* these examples back up the theory.
2. **Weaknesses:** what counts against the theory? This might include studies with contradictory findings, real world examples that go against the theory or just missing bits or contradictions in the theory itself.
3. **Application:** how can this theory help us? It's important to describe what people can *do* with the theory. This might include professional people (like nurses or police officers), other psychologists (who might want to research new things because of this theory) or members of the public (like yourself)
4. **Comparison:** how is this theory similar or different to other theories? Don't make the mistake of just describing another theory. You have to focus on the similarity or the difference.

COGNITIVE THEORY: ATKINSON & SHIFFRIN (1968) MULTI STORE MODEL

Context

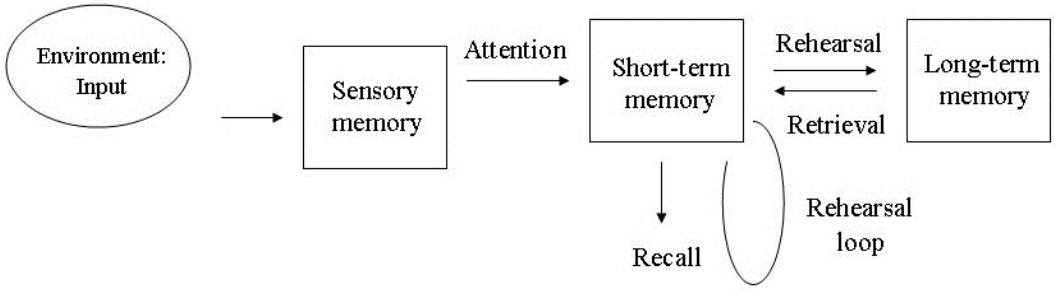
This theory was developed by Richard Atkinson & Richard Shiffrin (yes! they were both named Richard!). It is sometimes called the "Three Stage" memory model because it is a linear model of memory that proposes three distinct memory stores that have different characteristics: Sensory Memory, Short Term Memory (STM) and Long Term Memory (LTM).

This theory is significant for students in other ways:

- It shows how scientific research proceeds. Before Atkinson & Shiffrin, memory had been viewed as learned behaviour (ie classical conditioning) but these researchers moved research towards the idea of information processing. This was part of the "Cognitive Revolution" in Psychology in the late '60s and '70s.
- It illustrates features of the Cognitive Approach, since it expresses the processes of memory as a diagram or flowchart, which resembles the sort of information processing used by a computer
- It ties in to your Key Question in Cognitive Psychology, since it helps explain Alzheimer's
- It is important for you to understand how Working Memory and Tulving's research into Declarative Memory further develops this model

The Three Stages of Memory

Memory is viewed as information which comes from our environment through the 5 senses. It is stored (briefly) in Sensory Memory, which lasts less than a second. If information is **attended to**, it flows into STM, which has a duration of up to 20 seconds. If it is **rehearsed**, it is encoded in LTM which has an unlimited duration.



Information can be **retrieved** from LTM and brought back into STM.

Information can be **recalled** from STM and brought into the conscious mind.

The rehearsal loop stores up to 9 items of information and the more often information is "**looped**" through the STM, the more securely it is rehearsed.

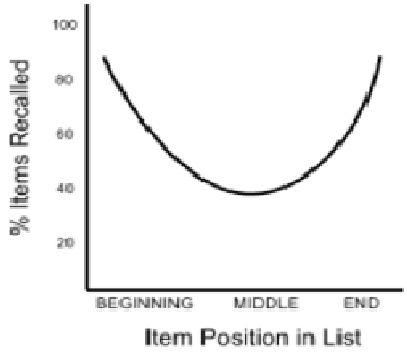
- Atkinson & Shiffrin focused on two types of encoding: acoustic (sound) and semantic (meaning). They found the STM works mostly by acoustic encoding; LTM uses all types of encoding but favours semantic.
- The structure of STM was developed by Baddeley & Hitch with **Working Memory**. The structure of LTM was developed by Tulving with **Episodic and Semantic Memory**.

Research into Multi Store

A lot of research into the Rehearsal Loop uses the **Brown-Peterson Technique**. This involves blocking rehearsal by getting participants to do an interference task like counting backwards in threes (eg 54, 51, 48…). Participants might learn meaningless information (like three-letter **trigrams** such as BHK) then perform the interference task for different durations. Participants forget most trigrams after 9 seconds of interference and almost all of them after 18 seconds. This tells us the duration of STM.

Miller (1957) did an earlier study into "the Magic Number 7, plus or minus 2". He found that STM has a capacity of 7 items (or "bits") of information comfortably, but struggles to hold more than 9. Miller found that "bits" of information can be grouped together into "chunks". STM can hold more information in chunks, but loses accuracy (eg recalling a whole face instead of remembering eye colour).

Glanzer & Cunitz (1966) did another early study into forgetting. Asked to recall a list of words in any order, participants tended to recall more from the beginning/end of the list and fewer from the middle. This is the **primacy/recency effect**. It happens because primacy words are well-rehearsed and encoded in LTM, recency words are still in the Rehearsal Loop; middle words are displaced by recency words because of the limited capacity of STM. This is known as the Displacement Theory of forgetting.



Atkinson & Shiffrin originally proposed that the Rehearsal Loop worked by repeating (looping) information over and over. This is **Maintenance Rehearsal** and it is similar to rote learning. **Raaijmakers & Shiffrin (2003)** later proposed another type of rehearsal – **Elaborative Rehearsal**. This involves semantic encoding by thinking about the meaning of information. This is similar to creating mind maps and is more effective for encoding information in LTM than Maintenance Rehearsal.

Applying the Multi Store Model (AO2)

Eyewitnesses

Eyewitnesses see events like crimes or accidents first hand but they are notoriously unreliable when they report on what they saw. There are many people in prison because they were falsely accused by eyewitnesses. **Gary Wells (1996)** reports the case of **Ed Honacker** who served 10 years for rape, after the victim identified him as her attacker. He was released in 1994 when DNA evidence proved his innocence.

This might happen because of inattention. If eyewitnesses are distracted, key details might not reach STM. Other details might not reach LTM if they are not rehearsed – if the victim refuses to think about or talk about the crime because it was so traumatic, they won't rehearse the information, at least not Elaborate Rehearsal.

During a traumatic event, the eyewitness might not want to "chunk" the information, blotting out the "big picture" and focussing on individual details (eye colour, shape of nose); this makes misidentification more likely.

Clive Wearing & H.M.

Clive Wearing received brain damage to his hippocampus after a viral infection. His case study is reported by **Colin Blakemore (1988**). Clive Wearing could still use his STM to remember things for about 20 seconds but then he would forget everything – he could not "make new memories". The Multi Store Model can be applied to his case, because it suggests an inability to rehearse information into LTM.

A similar case was **H.M.**, a young man who had brain surgery in 1953 to cure his severe epilepsy. When the hippocampus was damaged, H.M. was left unable to make new memories. However, he still had a lot of memories from before his surgery, which suggests he still possessed LTM, but could no longer add to it. He died in 2008 and his real name was revealed to be **Henry Molaison**. H.M. is studied in more detail in the Contemporary Study by **Schmolck et al. (2002)**.

Evaluating the Multi Store Model (AO3)

Strengths

There's a lot of research in support of the Multi Store Model, particularly into the primacy/recency effect and rehearsal. Studies like **Glanzer & Cuntiz (1966)** show how memories are displaced from STM when they exceed its capacity, which **Miller (1957)** shows to be 7 ±2 "bits" or "chunks".

There's also a lot of support from case studies of unusual individuals like H.M. or Clive Wearing. The Multi Store Model explains their disability as a failure to rehearse information, preventing them from encoding information in LTM.

Weaknesses

Although H.M. and Clive Wearing seem to back up the Multi Store Model, other evidence contradicts it. **Shallice & Warrington (1970)** report a victim of a motorbike accident who could still add memories to LTM even

though his STM was damaged. MSM cannot explain this.

The model is based on lab experiments involving tasks like the Brown-Peterson Technique. These are quite artificial, often involving meaningless trigrams. In real life, you use your memory to recall information that is important to you and there are usually consequences if you forget. If the experiments into MSM lack ecological validity, then the model won't explain how memory works in real life situations.

Application

Working Memory tells us how to improve our memory in some situations. If you are an eyewitness then you need to pay close attention to encode information in STM. You then need to rehearse it. Repeating the information over and over works, but Elaborative Rehearsal is better because it encodes information semantically. For example, students should make mind maps or use colour coding to focus on meaning.

The model may have application to helping people with dementia or brain damage. If patients struggle to rehearse new information, then writing things down and putting labels on things will help. Colour coding buttons on phones or remotes will also help because it brings in Elaborative Rehearsal.

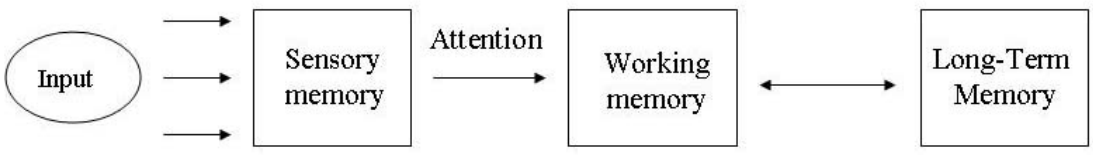
Comparison

The Multi Store Model can be compared to **Working Memory (Baddeley & Hitch, 1974)**. Working Memory replaces STM in the model and provides a more detailed explanation of rehearsal and retrieval from LTM. Most psychologists consider Working Memory to be an improvement and a refinement on the (rather simplistic) Multi Store Model.

Reconstructive Memory is a different approach to memory involving schemas. However, in Working Memory it is the Central Executive that creates and retrieves schemas to help the slave systems do their jobs. This is another example of Working Memory incorporating and improving on other theories.

A different theory of memory is **Levels of Processing Framework (Craik & Lockhart, 1972)**. This theory ignores separate stores altogether. It suggests that encoding a memory is about the "depth" of processing. Semantic encoding is much "deeper" than acoustic or visual encoding, making this information easier to remember. We also have much more capacity when we try to store meaningful things: most people can only store up to 9 numbers or trigrams but they can store up to 20 words.

Richard Shiffrin used this idea when he introduced Elaborative Rehearsal to the MSM in 2002.



EXAM STYLE ANSWERS

Evaluate the Multi Store Model of memory. (8 marks)

- *A 8-mark "evaluate" question awards 4 marks for AO1 (Describe) and 4 marks for AO3 (Evaluate).*

Description

Atkinson & Shiffrin propose that memory has three stages or stores: a Sensory Memory for sensations, a Short Term Memory (STM) and a Long Term Memory (LTM).

Information goes into STM when you attend to it. STM has a capacity of up to 9 items and a duration of up to 20 seconds. Information can go into a Rehearsal Loop to remember it for longer.

Information goes into LTM when you rehearse it. There is no limit to the capacity or duration of LTM. Information can be retrieved from LTM by STM and then recalled into the mind.

Forgetting seems to happen when information isn't attended to or rehearsed. Information can be displaced if STM gets overloaded. For example, in a list of over 10 items, people have a tendency to remember the beginning and the end.

To get 4 marks for AO1, I'm making 4 clear and different points about Multi Store Model.

I'm writing 4 paragraphs, hoping to get a point for each.

(I've probably included more than I need in each paragraph – but I've made a point of including something about forgetting and displacement too)

Evaluation

MSM is supported by case studies of people like H.M. and Clive Wearing. Because of brain damage, these people have amnesia and cannot make new memories. MSM suggests they fail to rehearse information from STM to LTM.

However, Shallice & Warrington (1970) report someone who lost their STM in a crash but could still make new LTM memories. MSM can't explain this.

Most of the studies into MSM lack ecological validity because the Brown-Peterson Technique is unrealistic. Learning lists of trigrams is not an ordinary activity. This means the model is based on research that lacks ecological validity.

To get 4 marks for AO3, I'm making 4 clear and different points about evaluation issues.

Again, I'm writing 4 paragraphs, hoping to get a point for each.

(I've included some facts about the theory here too but these are separate from the "description" above)

MSM can be compared to Working Memory. It is more simplistic than Working Memory, because it doesn't split STM up into acoustic and visual systems.

Conclusion

MSM was a very influential memory model but it has been replaced by more complex ones like Working Memory and Levels of Processing Framework. Shiffrin added Elaborative Rehearsal to MSM to try to bring it up to date, so even he must recognise this.

To get into the top band (7-8 marks) I must remember to write a conclusion.

Apply the Multi Store Model of memory. (4 marks)

- *A 4-mark "apply" question awards 4 marks for AO2 (Application) and gives you a piece of stimulus material.*

  Ashleigh and Callum are buying sweets in the corner shop when they see a car drive past and crash into a lamp post. A lot of people run into the street to help. Later on, a journalist asks them to describe the event! To their surprise, they both give very different accounts of what happened.

Using your knowledge of psychology, explain why their memories are different.

MSM would explain Ashleigh and Callum's different memories because they might have been paying attention to different things. If you don't pay attention to something, it is forgotten as soon as it leaves the Sensory Memory.

Even if they paid attention to the same thing, they might not both have rehearsed it. If Ashleigh talked about it or thought about it afterwards, she would be more likely to have the memory in LTM.

With so much going on, their STM might have been overloaded. STM has a capacity of up to 9 items so some details may have been missed.

Displacement Theory means Ashleigh and Callum should remember details from the beginning and end of the accident (primacy/recency), but they might forget different details from the middle.

To get 4 marks for AO2, I'm making 4 clear and different applications of Multi Store Model.

I'm writing 4 paragraphs, hoping to get a point for each. Because this isn't a 8-mark or 12-mark essay, I don't need a conclusion. Just the 4 points will do

COGNITIVE THEORY: TULVING (1972) SEMANTIC LONG TERM MEMORY

Context

This theory was proposed by **Endel Tulving**, one of the leading figures in memory research. It is based on the Multi-Store Model idea of LTM, but it suggests there is a difference between episodic memory (eg remembering a family holiday in Disneyland) and more general memory (eg knowing that Disneyland is in Florida).

This theory is significant for students in other ways:

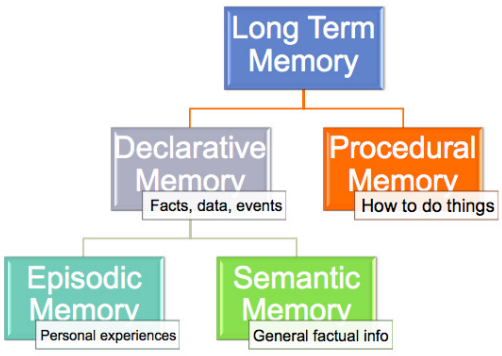
- It shows how scientific research proceeds, because Tulving's distinction is an advance on Atkinson & Shiffrin's (1968) Multi Store Model. It also ties in with Baddeley's research into semantic encoding in LTM.
- It illustrates features of the Cognitive Approach, since it expresses the processes of memory as a diagram or flowchart, which resembles the sort of information processing used by a computer
- It ties in to your Key Question in Cognitive Psychology, since it helps explain Alzheimer's
- It shows the importance of neuroscience which combines the Cognitive and Biological approaches, because functions of Semantic LTM have been located in parts of the brain (eg the Contemporary Study by Schmolck et al.)

Declarative Memory

Tulving makes a distinction between different types of LTM: procedural memory and declarative memory.

- **Procedural memory** is the memory of how to do things. It includes tying shoelaces, writing, tapping in your banking PIN and using a knife and fork. You may retain procedural memories even after you have forgotten being taught to do these things in the first place.
- **Declarative memory** is the memory of meaningful events.

You might remember being taught to play the guitar, even if you've forgotten how to do it.



Tulving splits declarative memory into two sub-types:

- **Episodic memory** is the memory of particular events and specific information: events, names and dates. It includes memories of things that have happened to you and information like a person's address.

  Episodic memories seem to be **perceptually encoded** – they are linked to the 5 senses which is why they can be triggered ("cued") by a sight or a sound or a smell. Tulving gives examples like remembering he has an appointment with a student the next day or recalling words from a list studied earlier as well as autobiographical memories (remembering details from your own past).

- **Semantic memory** is the memory of relationships and how things fit together. It includes the memory that you have brothers or sisters, where things are located and what they do.

  Semantic memory is needed for language because words have meaning – learning words in the first place involves episodic memory but once they are learned they go into the **semantic store**. Tulving gives examples like knowing that summers are hot in Kathmandu and knowing that July is the month after June.

The case of Clive Wearing

Clive Wearing is a musician who suffered brain damage from a viral infection (*herpes simplex encephalitis*) in 1985. He suffered almost complete amnesia. He also lost the ability to encode new long term memories. Clive Wearing forgets everything within 30 seconds and is always "coming into consciousness", feeling he is waking up for the first time.

However, although Clive Wearing has lost his episodic memory, he still has semantic memory. When his wife Deborah enters the room he greets her joyously, believing he hasn't seen her for years or even that they are meeting for the first time (even if she has only been gone for a minute). Although he has know episodic memories of Deborah, he has semantic knowledge of her: he remembers that he loves her.

Similarly, although he cannot remember their names or ages, Clive Wearing knows that he is a father and that he has children.

Clive Wearing also has intact procedural memory. He can still play piano and conduct a choir – although he cannot remember his musical education and as soon as the music stops he forgets he was performing and suffers a shaking fit.

Sir Colin Blakemore (1988) carried out a case study on Clive Wearing. Blakemore discovered that damage to Clive Wearing's brain had been to the

hippocampus, which seems to be the part of the brain where the Short Term Memory (STM) rehearses information to encode it into LTM.

- The Contemporary Study by **Schmolck et al. (2002)** looks at other patients with amnesia because of damage to the hippocampus, include patients like Clive Wearing who suffered herpes encephalitis infection. These patients also struggled with semantic memory because of damage to the wider **temporal cortex**.

Applying Episodic & Semantic Memory (AO2)

Jogging your memory

Tulving argues that episodic memory is encoded based on how it was experienced (the **encoding specificity principle**). This means that when a memory is stored details of time and space (when and where) are stored with it. This is why people can normally answer the question "When did that happen?" or "Where were you with that happened?" Even if they cannot give exact dates or places, they can reply, "Before the summer holidays," or "At my old school."

This means that episodic memory can be "jogged" by **context cues** – things that remind you of when/where the original memory was encoded. **Godden & Baddeley (1974)** tested this and found that divers who learned words underwater recalled them better underwater than back on dry land.

Semantic memory doesn't seem to be organised this way. Instead, it seems to work using rules. For example, you might remember how to spell "receipt" by applying the rule "'*i*' before '*e*' except after '*c*'."

Episodic memory seems to be changed by being used. For example, when people recall and event, it gets re-encoded into LTM and may get altered as a result. This is how false memories occur. Semantic memory doesn't seem to work like this. Your memory of relationships and meanings is not changed by being used and it can be quite separate from episodes.

Dementia & Alzheimer's

The most common symptom of dementia is difficulty to make new memories. STM (which rehearses information) is the first type of memory to go. Episodic memory is the next to go, as sufferers begin to forget autobiographical events. Usually, recent episodes are lost first, but sufferers still remember episodes from their young adulthood and youth. Semantic memory is lost later, when sufferers struggle with language and no longer recognise family members. As the disease advances, parts of memory which were previously intact also become impaired. Eventually all reasoning and language abilities are disrupted.

Patients tend to display a loss of knowledge of **semantic categories**. Initially, they lose the ability to distinguish **fine categories**, such as species of animals or types of objects, but, over time, this lack of discrimination becomes more general. At first, a patient with advanced dementia may see a spaniel and say, "That is a dog." Later, they may just say, "That is an animal".

Evaluating Episodic & Semantic Memory (AO3)

Strengths

There's a lot of research in support of Tulving's distinctions. Some of this is case studies of amnesia patients like Clive Wearing who have lost episodic memory but still have semantic memory. The deterioration of dementia patients also suggests that episodic and semantic memory are separate.

The Classic Cognitive Study by **Baddeley (1966b)** also supports the existence of semantic memory. Baddeley found that participants struggled with word lists linked by a common theme, which suggests the semantic similarity confused LTM. Unrelated word lists were not confusing. This suggests at least part of LTM works semantically.

The Contemporary Study by **Schmolck et al. (2002)** also supports the idea of semantic memory existing and being located in a specific part of the brain – the temporal cortex – which would explain why Clive Wearing still retained semantic memory because his brain damage was elsewhere, in the hippocampus (although most of Schmolck's patients with viral brain damage had much more widespread lesions than Clive Wearing).

Weaknesses

It seems as if semantic and episodic memory both rely on each other and might not be all that separate. For example, if you learn that you husband or wife is unfaithful (episodic memory) you will probably trust them less (semantic memory) – which suggests that the two are linked.

Damage to the temporal cortex of the brain seems to cause problems with *both* types of memory, suggesting they are located in the same place and may turn out to be the same thing working in different ways.

Application

The distinction between semantic memory and episodic memory helps us understand patients with memory loss like Clive Wearing or people in the early stages of dementia. Though they may be confused by their amnesia, they might still remember relationships and meanings and this could be used to calm and focus them. Showing these patients meaningful things and getting them to talk about the meaning can be a type of **Cognitive Stimulation Therapy** – such as getting them to talk about how familiar songs or activities make them feel.

The distinction should help you with your revision. No matter how charming or colourful your teacher's explanations are, those are episodic memories that are specific to the time and place you encoded them – your Psychology lesson, not the exam hall. Semantic knowledge can be recalled anywhere, without needing "cues", but to encode things semantically you have to understand them. This means revising by creating your own mind maps, category lists and charts.

Comparison

Tulving's ideas tie in closely with the **Multi Store Model of Memory**, which proposes that LTM is a separate memory store from STM and that LTM is created through rehearsal. Tulving would agree, but argues there are different *types* of encoding, episodic and semantic. Shiffrin seems to have come round to this view and added

Elaborative Rehearsal to his model in 2003.

These ideas also link to the theory of **Reconstructive Memory** and Bartlett's ideas about **schemas**. Schemas are meaningful patterns of information: they can be stereotypes, but they are also categories ("farm animals", "kitchen appliances") which might differ from person to person and culture to culture. In other words, they are separate semantic stores. If Tulving's ideas are true, this makes Reconstructive Memory more plausible. If Reconstructive Memory is true, then semantic memory might have much more influence over episodic memory than Tulving imagined, because schemes dictate how we reconstruct our memories.

EXAM STYLE ANSWERS

Evaluate the theory of Episodic and Semantic Memory. (8 marks)

- *A 8-mark "evaluate" question awards 4 marks for AO1 (Describe) and 4 marks for AO3 (Evaluate).*

Description

Tulving took the Multi Store Model and proposed two different types of LTM: episodic memory (memory of events) and semantic memory (memory of facts and meanings).

Episodic memory is linked to the 5 senses and it is specifically encoded. The time and place the memory was created is encoded with it.

Semantic memory is more like a memory of rules. It is independent of time and place. This is why you don't need to be in the place you learned something to remember it.

An example of semantic memory would be Clive Wearing. His brain damage meant he lost his episodic memory but he still recognises his wife Deborah and remembers that he loves her.

Evaluation

Tulving's ideas are supported by lab experiments like Baddeley (1966b). Baddeley showed that LTM is confused by word lists with similar meanings. LTM must be encoded semantically because similar sounding word lists had no such effect.

However, Baddeley's studies lack ecological validity because they are unrealistic. Learning lists of similar sounding words is not an ordinary activity. This means the theory is based on research that lacks ecological validity.

You could help dementia patients by giving activities like singing songs that are meaningful for them then asking them about their feelings. This is Cognitive Stimulation Therapy.

To get 4 marks for AO1, I'm making 4 clear and different points about semantic memory.

I'm writing 4 paragraphs, hoping to get a point for each.

(I've probably included more than I need in each paragraph – but I've made a point of including something about a case study explained by the theory)

To get 4 marks for AO3, I'm making 4 clear and different points about evaluation issues.

Again, I'm writing 4 paragraphs, hoping to get a point for each.

(I've included some facts about the theory here too but these are separate from the "description" above)

Semantic Memory is an improvement on the Multi Store Model. It suggests there may be different types of LTM just the way Working Memory suggests there may be different processes going on in STM. It also links with Reconstructive Memory because semantic stores seem to be similar to schemas.

Conclusion

Semantic memory is a very important idea because it explains how we link our memories together and how we learn things like language. However, sometimes episodic and semantic memory seem very similar. For example, if you know the end of a joke (episodic memory) you stop finding it funny (semantic memory), which suggests the two may not be so different.

To get into the top band (7-8 marks) I must remember to write a conclusion.

Notice that for a 8-mark answer you don't have to include *everything* in the theory. I haven't mentioned procedural memory or the different parts of the brain. I haven't described Schmolck's research into semantic LTM and brain damage.

But I have tried to make the two halves – Description and Evaluation – evenly balanced.

Apply the theory of Episodic and Semantic Memory. (4 marks)

- *A 4-mark "apply" question awards 4 marks for AO2 (Application) and gives you a piece of stimulus material.*

  Greta has colour coded her Psychology revision, using blue ink for studies, red for theories, green for applications and pink for evaluations. Nigel figures he'll remember his Psychology work in the exam because his teacher is always coming out with funny anecdotes. When they get their results, Greta has a much higher grade than Nigel.

Using your knowledge of psychology, explain why Greta remembered her Psychology work better than Nigel.

Semantic Memory would explain Greta's memory. By colour coding her revision, she is putting it into semantic categories in LTM. Semantic categories are meaningful groupings.

Whereas Nigel is depending on episodic LTM which contains memories of particular events. In the exam, he will have to try to recall a particular occasion when his teacher explained something.

Tulving argues that episodic memory is perceptually and specifically encoded. This means it is hard to access episodic memories when you are in a different place and when there isn't a context cue from the 5 senses. This would be a problem for Nigel in the exam hall.

To get 4 marks for AO2, I'm making 4 clear and different applications of episodic and semantic memory.

I'm writing 4 paragraphs, hoping to get a point for each.

Because this isn't a 8-mark or 12-mark essay, I don't need a conclusion. Just the 4 points will do.

Semantic memory isn't linked to any context. This makes it easier for Greta to recall information when she is not in her classroom and is not hearing her teacher's voice.

COGNITIVE THEORY: BADDELEY & HITCH (1974) WORKING MEMORY

Context

This theory was developed by **Alan Baddeley & Graham Hitch**, based on Baddeley's research into memory in the '60s. It comes from Baddeley's realisation that memory was in fact more complicated than the Multi Store Model made out, in particular the role of Short Term Memory (STM). Baddeley proposes Working Memory as something the carries out the functions of STM and some of the work of LTM as well.

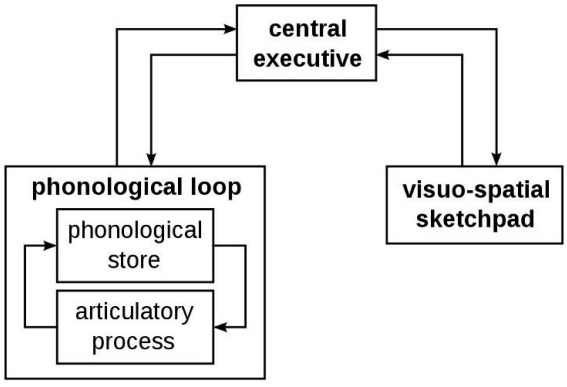
This theory is significant for students in other ways:

- It shows how scientific research proceeds, because Working Memory is an advance on Atkinson & Shiffrin's (1968) Multi Store Model. The theory of Working Memory has itself been added to and improved over the years
- It illustrates features of the Cognitive Approach, since it expresses the processes of memory as a diagram or flowchart, which resembles the sort of information processing used by a computer
- It ties in to your Key Question in Cognitive Psychology, since it helps explain Alzheimer's
- It shows the importance of neuroscience which combines the Cognitive and Biological approaches, because functions of Working Memory have been located in parts of the brain

The Basic Processes of Working Memory

Baddeley noticed in his earlier memory experiments that participants who were asked to listen to two things at the same time or look at two things at the same time became confused. However participants were quite able to listen to something while looking at something else. This suggests that sound and vision are processed separately by memory (the **dual test paradigm**).

Baddeley and Hitch proposed a bas ic version of Working Memory, in which one memory system handles sound (the **Phonological Loop** or "inner voice") and another handles vision (the **Visuo Spatial Sketchpad** or "inner eye"). These two "slave systems" are managed by the Central Executive. Baddeley & Hitch describe the CE as



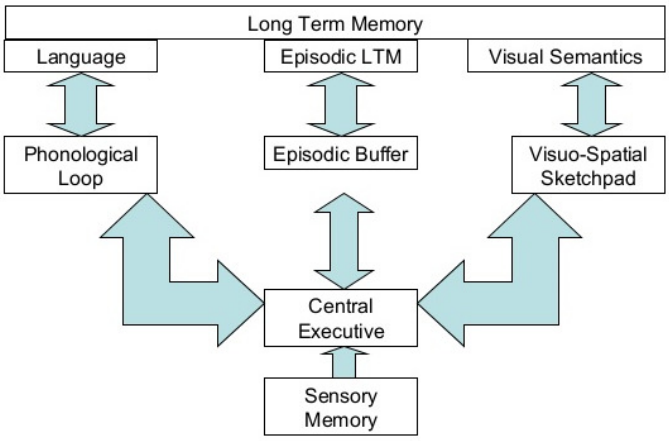
being like a "little man" ("***homunculus***") inside your head, organising your memories.

- The CE itself doesn't handle memories but it allocates them to the slave systems. It retrieves information from LTM and assigns it to the Loop or the VSSP for processing. It has **non-specific modality** – it can process sight, sound or any of the 5 senses.
- The Phonological Loop seems to be split into two sub-systems: an **Articulatory Loop** (inner voice) which voices information you are rehearsing and a **Primary Acoustic Store** which just holds on to the memory of sounds.

Improvements to Working Memory (2000)

Baddeley carried on doing research with patients with amnesia who couldn't encode new memories (see the **Schmolck et al.** study for examples of this). He found that some of these patients could repeat back far more details of a story than they could be keeping in the Phonological Loop.

In 2000, Baddeley published a new version of Working Memory with a new, third slave system: the **Episodic Buffer**. This system works between the Loop and the VSSP and specialises in semantic memory, bringing elements of information together into patterns or stories.



Evidence for Working Memory

The main evidence comes from dual testing:

- Participants in tests get confused by lists of items that sound similar but not by items with similar meaning. This suggests that part of STM is coding acoustically. For example, **Baddeley (2003**) found that similar-sounding letters (eg V, B, G, T, P, C) are not recalled as well as dissimilar sounding letters (eg W, X, K, R, Y).
- Memory recall of words is ruined if participants are asked to recite irrelevant words aloud at the same time. This seems to block acoustic rehearsal.

Some evidence comes from brain scanning:

- The Phonological Loop seems to be located in the **left hemisphere**, specifically in the **temporal lobe**
- The VSSP is in the **right hemisphere**, with simple tasks in the **occipital lobe** and

complicated ones in the **parietal lobe**.

- The Episodic Buffer seems to be in both hemispheres (bilateral) but particularly in the **hippocampus** (which links to the **Schmolck et al** study)
- The Central Executive seems to be linked to the **frontal lobes**.

Applying Working Memory (AO2)

The Cocktail Party Effect

The "Cocktail Party Effect" is the confusion you experience when you are trying to listen to two conversations at once. It's an example of the Dual Task Paradigm. Working Memory explains why we experience this. The Loop and the VSSP are supposed to work together but if you have two sources of information tat must be processed in the same way (two sets of sounds or two sets of images) then the slave system gets overloaded.

This doesn't happen when you are processing two different sources of information – which is why you *can* play on your Xbox *and* listen to your mother at the same time (despite her telling you that you can't).

Dementia & Alzheimer's

Dementia sufferers have particular trouble with dual tasks. Baddeley & Erses adapted tasks for Alzheimer's sufferers and found they still struggled with this, Baddeley suggests this is a fault with the Central Executive which may explain a lot of dementia symptoms.

The dual load can be reduced by creating a quiet environment for dementia sufferers without background noise (turn off the TV/radio etc).

The Episodic Buffer was introduced to the model to explain why brain-damaged patients can still recall stories or lists without the use of LTM. It may explain why Cognitive Stimulation works for dementia patients. Cognitive Stimulation uses prompts and activities to reawaken early memories and get patients to talk about their lives. Pulling memories together into a story is the job of the Episodic Buffer which can "pick up the slack" from the other two slave systems.

Evaluating Working Memory (AO3)

Strengths

There's a lot of research in support of Working Memory, particularly into the dual task paradigm. These show that some dual tasks are more difficult than others (for example, ones where there are two sources of information with the same encoding) and Working Memory explains why this should be.

The idea of the "inner ear" and the "inner eye" are quite easy to understand and match up with what it *feels* like when we remember things – this is called **face validity**. The model has also been backed up by brain scanning which shows acoustic and visual encoding going on in different parts of the brain.

Weaknesses

New data has emerged which the original (1974) model couldn't explain – such as the brain-damaged patients who could repeat complex stories. However, the addition of the Episodic Buffer (2000) does improve the model. More research needs to be done on the Episodic Buffer because, unless the other two slave systems, it isn't completely clear what it does.

The model is based on lab experiments involving dual tasks. These are quite artificial. In real life, even at cocktail parties, you use your other senses (such as paying attention to body language or lip-reading when someone speaks). If the experiments into Working Memory lack ecological validity, then the model won't explain how memory works in real life situations.

Application

Working Memory tells us how to improve our memory in some situations. If you have to encode something in one particular way (like listening to a radio broadcast) then remove competing information (by muting the TV). However, it suggests you *can* concentrate on two differently coded sources at once – so you can do revision by copying a mind map while listening to a podcast.

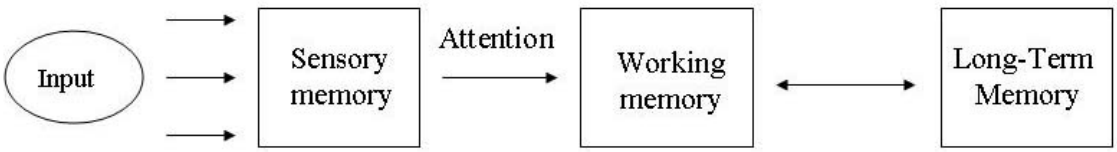
The model may have application to helping people with dementia. Using the Episodic Buffer seems to help people who cannot encoded memories in LTM or have trouble retrieving LTM. This means using Cognitive Stimulation: playing an old song and asking the patient to tell the story of how they first heard it.

Comparison

Working Memory is similar to the **Multi Store Model** (**Atkinson & Shiffrin, 1968**). In fact, you might say Working Memory is a development of the MSM, with Working Memory replacing the STM Store. It's still a linear model of memory, with the idea of information coming from the senses to the Sensory Store, being processed in Working Memory then encoded into LTM, from which is can be retrieved by the Central Executive.

Working Memory is regarded as the most successful memory model at the moment because it is supported by evidence about the structure of the brain and the Working Memory model gets updated in the light of new discoveries in neuroscience. It is a model that is still developing (such as the addition of the Episodic Buffer in 2000) whereas the MSM is "fixed" and has not developed much since the '70s.

Reconstructive Memory is a different approach to memory involving **schemas**. However, in Working Memory it is the Central Executive that creates and retrieves schemas to help the slave systems do their jobs.



This is another example of Working Memory incorporating and improving on other theories.

EXAM STYLE ANSWERS

Evaluate the theory of Working Memory. (8 marks)

- *A 8-mark "evaluate" question awards 4 marks for AO1 (Describe) and 4 marks for AO3 (Evaluate).*

Description

Baddeley & Hitch propose that Working Memory consists of three parts: a Central Executive (CE) and two slave systems, the Phonological Loop and the Visuo Spatial Sketchpad.

The Phonological Loop processes sound and includes the "subvocalising" process known as the "inner voice". It also includes the Primary Acoustic Store which is a short-term memory for sound.

The VSSP processes sights and distances. The two processes are separate and this was shown through the Dual Task Paradigm. Participants trying to learn two sets of visual information overload the VSSP and make mistakes, but this doesn't happen when leaning visual and acoustic information.

The CE organises the two slave systems and retrieves information from LTM. It can switch its attention between any of the 5 senses.

To get 4 marks for AO1, I'm making 4 clear and different points about Working Memory.

I'm writing 4 paragraphs, hoping to get a point for each.

(I've probably included more than I need in each paragraph – but I've made a point of including something about the research that inspired the theory)

Evaluation

Working Memory is supported by the dual task paradigm. For example, Baddeley (2003) tested participants' recall of similar sounding letters (E, G, P, etc) and found they got lower scores than with dissimilar letters (W, X, K, etc). If the Phonological Loop is overloaded, that would explain this.

However, Baddeley's studies lack ecological validity because they are unrealistic. Learning lists of similar sounding words is not an ordinary activity. This means the model is based on research that lacks ecological validity.

You could apply Working Memory to helping dementia patients by giving them a quiet environment, so that background noise doesn't confuse them with dual tasking.

Working Memory is a better model than the Multi Store Model. It replaces STM with something more complicated. It fits in with evidence from brain scans and it was updated in 2000 when Baddeley added the Episodic Buffer.

To get 4 marks for AO3, I'm making 4 clear and different points about evaluation issues.

Again, I'm writing 4 paragraphs, hoping to get a point for each.

(I've included some facts about the theory here too but these are separate from the "description" above)

Conclusion

Working Memory is the most successful memory model at the moment. It has been changed and improved over the years but it still fits in with what we know about the brain and

To get into the top band (7-8 marks) I must remember to write a conclusion.

schemas. However, more research needs to be done on the Episodic Buffer which is rather unclear.

Notice that for a 8-mark answer you don't have to include *everything* in the theory. I haven't mentioned the Articulatory Loop or the different parts of the brain. I haven't described Baddeley's research into the Episodic Buffer.

But I have tried to make the two halves – Description and Evaluation – evenly balanced.

Apply the theory of Working Memory. (4 marks)

- *A 4-mark "apply" question awards 4 marks for AO2 (Application) and gives you a piece of stimulus material.*

  Candace is listening to the lyrics of her favourite band, Lipstick Lollipop, when her mother asks her to go to the shop to buy milk and eggs. When Candace gets to the shop, she realises she can't remember what her mother sent her to buy. On the way home, she tries to sing the new Lipstick Lollipop song but she can't remember the lyrics either!

Using your knowledge of psychology, explain why Candace forgets things.

Working Memory would explain Candace's forgetfulness. The pop lyrics and her mother's instructions are both acoustic encoding and are processed by the Phonological Loop or "inner ear".

The Phonological Loop processes sound but gets overloaded by acoustic information from different sources. Candace's Phonological Loop can't cope with both sources at once so information is lost.

Candace doesn't just lose information from her mother's instruction, she forgets the lyrics too. Since the Phonological Loop couldn't do its job, the Central Executive couldn't send the information to LTM.

To get 4 marks for AO2, I'm making 4 clear and different applications of Working Memory.

I'm writing 4 paragraphs, hoping to get a point for each.

Because this isn't a 8-mark or 12-mark essay, I don't need a conclusion. Just the 4 points will do.

The other part of Working Memory is the Visuo Spatial Sketchpad. If Candace's mum had shown Candace the empty milk bottle and egg box, she would have encoded that visually and remembered it.

COGNITIVE THEORY: BARTLETT (1932) RECONSTRUCTIVE MEMORY

Context

This theory was proposed by **Sir Frederick Bartlett**, one of the early figures in memory research. Bartlett's central insight was that memory is not like a tape recorder: it doesn't faithfully play back our experiences. Instead, it changes or "reconstructs" them imaginatively. Bartlett's ideas were neglected for decades but were brought back into the mainstream again when they were supported by experimental research by people like Elizabeth Loftus. Loftus argued that Reconstructive Memory implies that eyewitnesses to crimes will often be unreliable.

This theory is significant for students in other ways:

- It shows how scientific research proceeds, because Bartlett's fairly unscientific research in the 1930s was improved upon by Loftus, who mounted much more rigorous lab experiments in the '70s and '80s.
- It goes against the typical features of the Cognitive Approach, since it rejects the idea of memory being like the sort of information processing used by a computer
- This is a theory with important implications for policing and the courts as well as journalism and everyday life. If memory is Reconstructive, then can it be trusted to tell us the truth? Can we trust our own memories?

Schemas

Bartlett's main idea is that our memory is grouped into categories called "**schemas**". We have schemas for all sorts of thing – for what a "criminal" is like, for what counts as "food" and how to behave at the service counter in a fast food restaurant.

For example, in a Japanese sushi bar you might not know what behaviour is expected of you and it would be hard to make sense of what the other customers were doing and eating. But if you paid attention, you would figure it out: you would start to develop a new schema.

Sometimes we **assimilate** new information, changing our schemas to fit what we have learned; sometimes we **accommodate** new information, changing our memories to keep our schemas intact and unchanged.

Memory makes use of schemas to organise things. When we recall an event, our schemas tell us what is *supposed* to happen. The schemas might fill in the gaps in our memory (**confabulation**) and even put pressure on our mind to remember things in a way that fits in with the schema, removing or changing details. For example, you might remember the Japanese diners eating with chopsticks (because that's part of your schema for Japanese meals) whereas in reality the Japanese use their fingers to eat sushi.

The War of the Ghosts

Bartlett came up with the idea of "reconstructive memory" during a game of 'Chinese Whispers'. He developed a study based on this game. Bartlett showed 20 students a Native American ghost story (*The War of the Ghosts*) which had unusual features. He asked them to read it then recall it on several occasions after a few hours, days, weeks or even years – a technique called **serial reproduction** (and a Repeated Measures design). Bartlett compared how the recalled versions of the story differed from the original.

Participants **shortened** the story when they reproduced it, from 330 words to 180 words, with the shortest reproduction happening after the longest gap (two years).

Participants also **confabulated** details, changing unfamiliar parts of the story to familiar ideas in line with their schemas: canoes and paddles became boats and oars, hunting seals became fishing.

Participants **rationalised** the story, coming up with explanations for baffling parts of the story. For example, in later reproductions, participants missed out the "ghosts" and just described a battle between Native American tribes.

Bartlett didn't use many experimental controls, asking participants to reproduce the story whenever was convenient. He bumped into one student in the street two years later and asked her to reproduce *The War of the Ghosts* there and then. The changes in the stories were also down to his own subjective opinion.

Evidence in support of Reconstructive Memory

Allport & Postman (1947) showed participants a drawing (*right*) of an argument on a subway train. They were asked to describe it to another participant (like Chinese Whispers). The black character was better dressed and more respectable than the white character but, after serial reproduction, white participants tended to reverse their appearances.

Some even described the black character as holding a knife.

Elizabeth Loftus revisited Bartlett's idea of schemas in the 1970s in a series of experiments. **Loftus & Palmer (1974)** showed students film clips of real car crashes and set them a questionnaire to answer. There was only one critical question which asked about the speed of the cars. Some students read a critical question with an intense verb ("*How fast were the cars going when they smashed into each other?*") but others read a less intense verb like "*hit*".

Participants exposed to the "*smashed*" verb recalled a higher speed (40.8mph on average) than participants exposed to "*hit*" (34mph). Loftus & Palmer tested participants again a week later, asking them if there was any broken glass in the film clip. In fact there had bee no broken glass, which was recalled correctly by 12% of the Control group (who had never been asked about the speed of the cars) and 14% of the "*hit*" group; however, 32% of the "*smashed*" group falsely recalled broken glass.

Loftus concludes that eyewitnesses are unreliable because they are influenced by leading questions. When we reconstruct memories, we change them by incorporating new information we learned after the incident. We also incorporate our schemas (expecting broken glass after a "*smash*"). We cannot tell which parts of a memory are original and which parts are later changes and there's no way of going back to the original.

Applying Reconstructive Memory (AO2)

Unreliable eyewitnesses

Eyewitnesses to crimes and accidents often have to reproduce their testimony many times to journalists, the police or a court – this is like the serial reproduction in Bartlett's study.

Leading questions may come from the police (who have their own suspects in mind) or lawyers (who are trying to show someone to be innocent or guilty). If Loftus is right, this should make eyewitness testimony very unreliable, since the memories change when we learn more information.

Allport & Postman also shows how schemas distort memory, especially prejudices. We remember things the way we think they *ought* to be.

The **Devlin Report (1976)** concluded that juries should not convict where the only evidence is one eyewitness.

Dementia & Alzheimer's

Understanding schemas can help with supporting dementia sufferers. When memories are lost, the world becomes a frightening and confusing place. Carers may use familiar music from the past, old activities (gardening, playing games with children) or reminiscing about long ago events to activate schemas that sufferers are comfortable with.

This can be seen in the "dementia village" at **Hogeway**. Residents choose to live and spend time in areas of the village themed around their schemas – classy and cultural, working class and rustic, urban and busy, quiet and religious. The idea that we should "go along" with dementia sufferers' schemas is central to **Validation Therapy**.

Evaluating Reconstructive Memory (AO3)

Strengths

The idea of schemas has been supported in a lot of studies since the 1930s. Loftus carried out a range of lab experiments into reconstructive memory, all of which had tight experimental controls, standardised procedures and collected quantitative data, making them quite objective and reliable.

Schemas also explain the puzzling phenomenon of false memories. In 2005, **John Charles De Menezes** was mistaken for a terrorist and shot by police after the 7/7 London Bombing. Many eyewitnesses saw the shooting but their recollections were widely different and often exaggerated.

Weaknesses

The early study by Bartlett was not at all scientific. Bartlett did not follow standardised procedures, getting his students to reproduce the story as-and-when. He had no scoring system for measuring changes in recall other than counting the number of words. This makes his research conclusions subjective.

Bartlett's research was particularly unrealistic, getting Cambridge University students to recall Native American ghost stories.

The Allport & Postman study is widely misreported. You will see many Psychology text books and websites claiming this picture (*right*) was shown to participants and that white participants wrongly recalled the black man as holding the knife. But this was not in the original study. This seems to be a case of 'Chinese Whispers' happening to psychologists!

Application

The idea of schemas helps us understand some things about patients with memory loss like Clive Wearing or people in the early stages of dementia. Though they may be confused by their amnesia, they might still remember important schemas and this could be used to calm and focus them. For example, Clive Wearing still loved his wife and loved music, which he could still play. **Validation Therapy** involves "going along" with delusional ideas so as not to cause distress when a patient's schemas conflict with the real world.

Loftus is often called to US courts as an "expert witness" to advise juries about how much trust they should put in eyewitnesses. Loftus has been involved in a number of "recovered memory" cases where someone receiving psychotherapy starts to recall sexual abuse from their childhood that they had not known about before. Loftus argues these are "false memories" based on leading questions from therapists and schemas about child abuse in the media.

Comparison

Reconstructive Memory has links to Tulving's theories about Semantic Memory. Tulving argues our memory has semantic stores where we keep

our understanding of relationships and rules – very similar to schemas. If Reconstructive Memory is true, this makes Tulving's ideas more plausible. Moreover, semantic memory might have much more influence over episodic memory than Tulving imagined, because schemes dictate how we reconstruct our memories.

A criticism of Reconstructive Memory is that it doesn't explain *how* memory is reconstructed. The other cognitive theories of memory describe the *processes* at work in rehearsing, retrieving and recalling. These processes have been linked to specific parts of the brain thanks to brain scanning and research on patients with lesions in specific parts of the brain. Reconstructive Memory is much more vague about how schemas work and where they are located.

EXAM STYLE ANSWERS

Evaluate the theory of Reconstructive Memory. (8 marks)

- *A 8-mark "evaluate" question awards 4 marks for AO1 (Describe) and 4 marks for AO3 (Evaluate).*

Description

Reconstructive Memory says that our memory is based on schemas. These are fixed ideas about how people ought to behave or what things are supposed to look like. Schemas include stereotypes and prejudices.

A study by Allport & Postman showed participants a subway scene. After a 'Chinese Whispers' activity, participants changed the details in line with their prejudices. They reversed the the respectable black man and the white one

Reconstructing memories may involve confabulating (adding in details that weren't originally there) or rationalising (changing details so that they make more sense from your perspective).

Bartlett showed how participants changed *The War of the Ghosts* to fit in with their own expectations and understanding, such as replacing canoes with boats.

To get 4 marks for AO1, I'm making 4 clear and different points about semantic memory.

I'm writing 4 paragraphs, hoping to get a point for each.

(I've probably included more than I need in each paragraph – but I've made a point of including something about experiments explained by the theory)

Evaluation

The original studies into Reconstructive Memory were not very scientific. For example, Bartlett tested his Cambridge students during tutorials and carried out one test in the street, two years later.

However, in the '70s, Loftus did research into schemas with standardised procedures and experimental controls. She found schemas about car crashes made some participants falsely remember broken glass.

You could apply the idea of schemas to helping dementia patients by going along with beliefs or activities that are meaningful for them. This is Validation Therapy and it is used at the "dementia village" in Hogeway.

Reconstructive memory is similar to Tulving's idea of semantic LTM. Schemas seem to be semantic stores and Tulving suggests that semantic memory can cause episodic memories to change, which is exactly what schemas do.

Conclusion

Reconstructive memory is a very important idea because it suggests that eyewitnesses may not be reliable. However, it is controversial because a lot of the studies into it are either unscientific or extremely artificial or both. In real life, our memories may be more reliable than this theory makes out.

To get into the top band (7-8 marks) I must remember to write a conclusion.

Notice that for a 8-mark answer you don't have to include *everything* in the theory. I haven't mentioned assimilation/accommodation or the idea of memory being influenced by information acquired later. I haven't described Loftus' research into leading questions.

But I have tried to make the two halves – Description and Evaluation – evenly balanced.

Apply the theory of Reconstructive Memory. (4 marks)

- *A 4-mark "apply" question awards 4 marks for AO2 (Application) and gives you a piece of stimulus material.*

  You are sitting in a lesson and suddenly hear a loud explosion outside. You run to the window with all your classmates and see a large cloud of smoke and people running around. You are questioned the next day by the police about what happened.

Using your knowledge of psychology, explain why your recall of the event might differ from others who saw the same incident.

Reconstructive Memory would explain differences in memory. If I had a schema about explosions that involved lots of fire, I might remember seeing fire as well as smoke.

Somebody else might have a schema telling them explosions are due to terrorist attacks. They might remember dead or injured people or even gunfire.

Loftus argues we incorporate later knowledge into our memories. So if I later heard that the explosion was a boiler blowing up, I might remember the explosion coming from the boiler room.

Bartlett says we confabulate details by adding to our memories. We also rationalise them. I might rationalise the memory of people running around as people running away from the explosion.

The question doesn't specify Reconstructive Memory so I could write about any other theory – or a combination of theories – instead.

Because this isn't a 8-mark or 12-mark essay, I don't need a conclusion. Just the 4 points will do.

Lots of studies have been carried out into memory and forgetting but you are only expected to know about two in detail. One of them is the Classic Study – a piece of research from the height of the Cognitive Revolution that inspired other researchers who followed after. The other is a Contemporary Study – a piece of research from the 21st century that shows how cognitive psychology is conducted tody, with state of the art brain scanning technology that wasn't available in the '60s and '70s. There are four broad theories of memory which you are expected to understand, apply and evaluate:

- The **Classic Study** is **Baddeley (1966b)**
- The **Contemporary Study** is **Schmolck et al. (2002)**

To show **Knowledge & Understanding (AO1)**, there is a code to help you, APRC:

1. **Aim:** what were the researchers trying to find out? It helps to think of the researchers having a general research question in mind as well as something very specific they were hoping this study would show
2. **Procedure:** how was the study carried out? This includes the sample and how they were recruited, the IV and DV and experimental design, the tasks that the participants had to complete and the experimental controls that were put in place as well as any special apparatus that was used
3. **Results:** what happened at the end of the study? This might involve scores or behaviours that were observed. It could be quantitative or qualitative data.
4. **Conclusions:** what did the researchers think the results meant? How did they explain what happened?

To show **Application (AO2)**, you should be able to explain how this study would be used in the real world.

To show **Analysis & Evaluation (AO3)**, you must discuss the strengths and weaknesses of the theory and how it compares to other theories. There is a code to help you remember how to do this: GRAVE

1. **Generalisability:** is the sample representative of ordinary people?
2. **Reliability:** were the procedures consistent and could they be replicated? Would you get the same results again?
3. **Application:** who could use the conclusions of this study and what would they do with them?
4. **Validity:** is this study really showing what it claims to show? Can its results be explained in other ways? This includes **ecological validity** which is how realistic or artificial the study is
5. **Ethics:** does this study follow the BPS ethical guidelines or are participants being mistreated in some way? Don't bother explain why the study *does* follow the guidelines: that's simply to be expected

COGNITIVE CLASSIC STUDY: BADDELEY (1966b) LONG & SHORT TERM MEMORY

Context

This study was carried out by Alan Baddeley in the '60s. Baddeley (and Hitch) went on to develop the Working Memory Model in the 1970s so this study is quite important as part of the background to that theory. It charts Baddeley's growing realisation that memory was in fact more complicated than the Multi Store Model made out.

This study is significant for students in other ways:

- It shows how scientific research proceeds, because Baddeley carried out 3 experiments, performing one that produced baffling results, a second that corrected the first, then the third that you are studying.
- It illustrates features of the Cognitive Approach, since it uses the experimental method to try to isolate and measure functions of memory that are so subtle we don't normally realise they are going on
- It illustrates the power of the experimental method, making use of clever experimental controls to isolate and remove confounding (extraneous) variables
- It shows the importance of experimental design, since it uses both Independent Groups and Repeated Measures

The First Two Experiments

Baddeley started off trying to test LTM. He gave participants four trials at learning a list of words. Then he used a 20 minute delay (to remove STM) and asked participants to recall as many words as possible in order. He compared their score in the 5th trial with their score in the 4th trial 20 minutes earlier to see how much they had forgotten.

Baddeley's results weren't what he expected and he realised that the participants' STM was helping their LTM out, with the two memory stores working together. To remove this confounding variable, he carried out a second test. This time the participants would have to perform an interference task after hearing the list for words. This seemed to work, because it confused STM and meant that the participants were only using LTM to perform their recall tasks.

With his technique in place, Baddeley then carried out his third test, which is described below. He made one more change, adding in a slide show rather than tape recordings of the word lists, because he was disqualifying participants who couldn't hear well.

- Notice Baddeley's use of experimental controls. The first is the 20 minute delay to allow "forgetting" to take place. The second is the interference task which makes it hard for participants to use their STM to remember the words from the word list.
- Also notice Baddeley's scientific approach. When his results don't match what his hypothesis predicts, he suspects a confounding variable is at work. He designs a further experiment with more detailed controls to try to isolate the confounding variable and control it.

Baddeley's Third Experiment

Aim: To find out if LTM encodes acoustically or semantically. This is done by giving participants word lists that are similar in sound (acoustic) or meaning (semantic); if the participants struggle to recall the word order, it suggests LTM is confused by the similarity which means that this is how LTM tends to encode.

IV: The study has several IVs. (1) Acoustically similar word list or acoustically dissimilar; (2) semantically similar word list or semantically dissimilar; (3) performance before 15 minutes "forgetting" delay and performance after.

IVs (1) and (2) are tested using Independent Groups design but IV (3) is tested through Repeated Measures.

DV: Score on a recall test of 10 words; words must be recalled in the correct order

Sample: Men and women from Baddeley's university subject panel (mostly students); they were volunteers. There were 72 altogether, a mixture of men and women. There were 15-20 in each condition (15 in Acoustically Similar, 16 in Semantically Similar).

Procedure: The participants are split into four groups, according to IV (1) and (2). Each group views a slideshow of a set of 10 words. Each word appears for 3 seconds. They then carry out an "interference test" which involves hearing then writing down 8 numbers three times. Then they recall the words from the slideshow in order.

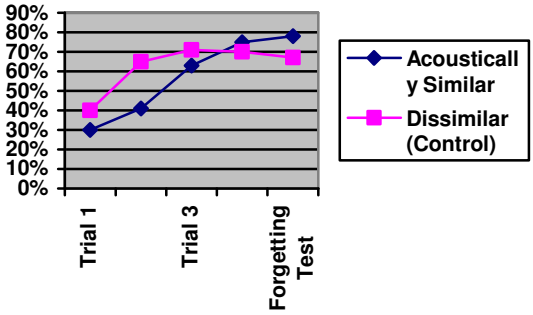
There are four "trials" and (as you would expect) the participants' get better each time they do it because the words stay the same. The words themselves are displayed on signs around the room so the participants only have to concentrate on getting the ORDER of the words right, not remembering the words themselves.

After the 4th trial, the participants get a 15 minute break and perform an unrelated interference task. Then they are asked to recall the list again. This fifth and final trial is unexpected. The words themselves are still on display; it is the order of the words the participants have to recall.

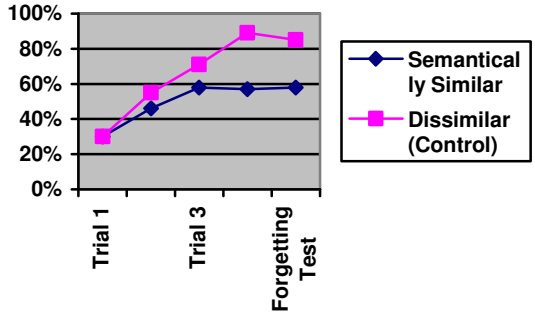
In the Acoustically Similar condition, the participants get a list of words that share a similar sound (*man, cab, can, max*, etc) but the Control group get words that are all simple one syllable words but they do not sound the same (*pit, few, cow, pen*, etc).

In the Semantically Similar condition, the words share a similar meaning (*great, large, big, huge*, etc) but the Control group get words that are unconnected (*good, huge, hot, safe*, etc).

Results: Baddeley was interested to see whether Acoustic or Semantic Similarity made it harder to learn the words. He compared the scores of the participants in the Similar and Dissimilar conditions and paid particular attention to whether they recalled as well in the 5th "forgetting" trial or whether there was a drop-off in scores.



Acoustically similar words seem to be confusing at first, but participants soon "catch up" with the Control Group and even overtake them, but this isn't statistically significant. Notice how LTM is not confused by acoustic similarities – scores on the last test are similar to the 4th trial, suggesting no forgetting has taken place.



Semantically similar words do seem to be confusing and the experimental group lags behind the control group. In fact, the experimental group never catches up with the Control Group and performs worse overall than the Acoustically Similar group above. Very little forgetting takes place, but scores are lower.

Conclusions: Baddeley concludes that LTM encodes semantically, at least primarily. His earlier experiments suggest STM encodes acoustically.

This is why LTM gets confused when it has to retrieve the order words which are semantically similar: it gets distracted by the semantic similarities and muddles them up. It has no problem retrieving acoustically similar words because LTM pays no attention to how the words sound.

The "slow start" in the Acoustically Similar condition would be because the interference task doesn't block STM 100% - some of the words linger on in the rehearsal loop. This means in most conditions, the participants' LTM gets a bit of help from STM. But in the Acoustically Similar condition, STM gets confused by the similar sounds the way that LTM gets confused by similar meanings. It can't be of much help so this group lags behind the Controls until all the words are encoded in LTM, at which point the two groups finally get similar scores.

Evaluating Baddeley

Generalisability

Baddeley has a large sample of 72. Any anomalies (people will unusually good or bad memories) will be "averaged out" in a sample this size. This suggests you can generalise from this sample.

However, there were so many conditions in this study that each group only had 15-20 people in it. That's not a lot. Only 15 people did the Acoustically Similar condition. An anomaly could make a difference to scores with numbers that small.

The sample was made up of American volunteers. It might be that there is something unusual about the memories of Americans or the memorable qualities of American words. However this is unlikely. LTM works the same for people from all countries, speaking all languages, so this sample is probably representative.

Reliability

This is a great example of a reliable study because it has standardised procedures that you could replicate yourself. You wouldn't need special equipment and you could use exactly the same words that Baddeley used.

Baddeley improved the reliability of his own study by getting rid of the read-aloud word lists (some participants had hearing difficulties) and replacing them with slides.

Application

The main application of this study has been for other Cognitive Psychologists, who have built on Baddeley's research and investigated LTM in greater depth. Baddeley's use of interference tasks to control STM has been particularly influential. Baddeley & Hitch built on this research and developed a brand new memory model – Working Memory.

Another application is for your own revision. If LTM encodes semantically, it makes sense to revise using mind maps that use semantic links. However, reading passages out loud over and over (rote learning) is acoustic coding, but LTM doesn't seem to work this way.

Validity

Baddeley took trouble to improve the validity of his experiment. He used controls to do this. Rather than getting participants to recall words, he asked them to recall *word order* (with the words themselves on display the whole time). This reduced the risk that some words would be hard to recall because they were unfamiliar or others easy to recall because they had associations for the participants.

However, the ecological validity of this study is not good. Recalling lists of words is quite unrealistic but you sometimes have to do it (a shopping list, for example). Recalling the *order* of words is completely artificial and doesn't resemble anything you would use memory to do in the real world.

Baddeley did improve this. For example, he made the 5th "forgetting" trial a surprise that the participants weren't expecting. This is similar to real life, where you are not usually expecting it when you are asked to recall important information.

Ethics

There are no significant ethical issues with this study so do not bring up ethics when evaluating it.

EXAM STYLE ANSWER

Evaluate the classic study from cognitive psychology. (8 marks)

- *A 8-mark "evaluate" question awards 4 marks for AO1 (Describe) and 4 marks for AO3 (Evaluate).*

Description

Baddeley investigated the differences between the way STM and LTM work. One group of participants had to recall acoustically similar words (like 'man' and 'max') and another group had to recall semantically similar words (like 'huge' and 'large').

This was a lab experiment where the IV was the type of encoding the participants had to do and the DV was their score.

There were 72 participants, with 15-20 in each condition. They recalled the words 4 times and had to recall them in the exact order. Then there was a 15 minute break and they were asked to recall the words a fifth time.

Baddeley found that participants struggled at first with Acoustically Similar words, but by the 3rd and 4th trial they were doing as well as the control group (around 70%) and ended up doing slightly better. However, the group with Semantically Similar words got much lower scores than the Control group.

To get 4 marks for AO1, I'm making 4 clear and different points about Baddeley's study.

I'm writing 4 paragraphs, hoping to get a point for each.

(I've probably included more than I need in each paragraph – but I've made a point of including numbers to show I know *details* about the study)

Evaluation

Baddeley had a very reliable experiment. In fact, he replicated it 3 times, improving the procedures each time. He used the same lists of words, gave the participants the same amount of time and tested them in the same way. This is called standardised procedures.

Baddeley improved the validity of his study by using controls. He added an interference task (writing down lists of numbers) before each trial to "block" the STM and make sure only LTM was being used. He also presented the words on slides because he didn't want to disqualify people for having bad hearing.

However, Baddeley's study lacks ecological validity because it is unrealistic. Learning lists of similar sounding or similarly themed words is not an ordinary activity. As with most memory tests, there was nothing at stake and no reason for participants to try hard to remember.

Baddeley had a big sample which is probably representative. However, there were 4 different conditions and one of them only had 15 people in it. This is quite a small group where an anomaly (someone with an unusual memory) might skew the results.

To get 4 marks for AO3, I'm making 4 clear and different points about evaluation issues.

Again, I'm writing 4 paragraphs, hoping to get a point for each.

(I've included some facts about the study here too but these are separate from the "description" above)

Conclusion

Baddeley designed an excellent study into memory with controls in place to remove extraneous variables. It still suffers from the problems of all lab experiments into memory – it's unrealistic – but it does show that LTM processes information differently from STM.

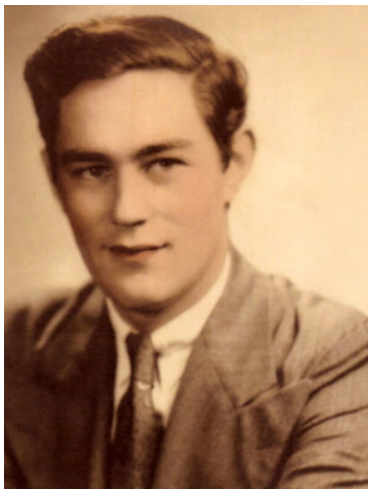
To get into the top band (7-8 marks) I must remember to write a conclusion.

Notice that for a 8-mark answer you don't have to include *everything* Baddeley did. I haven't mentioned the Control groups or the fact that the words were posted up for participants to see the whole time. I haven't mentioned the scores in the "forgetting" re-test. I haven't described Baddeley's conclusions.

But I have tried to make the two halves – Description and Evaluation – evenly balanced.

COGNITIVE CONTEMPORARY STUDY: SCHMOLCK et al. (2002) TEMPORAL LOBE BRAIN DAMAGE & LTM

Context



This study was carried out by **Heike Schmolck** on a group of patients who had all experienced brain damage and loss of memory. The most famous patient in the study was "**H.M.**" – real name **Henry Molaison** (1926-2002) – who had brain surgery for his epilepsy in 1953 and lost much of his LTM as a result. HM would recall information so long as it was in his short term memory, but then forgot it within seconds and could not create new episodic memories. However, he still remembered some things from before his brain damage.

HM has been called the most important patient in the history of brain science. Schmolck wanted to compare HM to other patients with similar brain damage to see if a precise link could be made between brain structure and semantic memory.

This study is significant for students in other ways:

- It shows how scientific research proceeds, because Schmolck used state of the art brain-scanning techniques to identify the parts of the brain damaged in each patient.
- It illustrates features of the Cognitive Approach, since it uses the experimental method to try to isolate and measure semantic LTM
- It illustrates the power and shortcomings of the natural (or quasi-) experimental method, because the patients' brain damage was a naturally-varying IV outside Schmolck's control
- It shows the growing importance of neuroscience – the link between Cognitive and Biological psychology

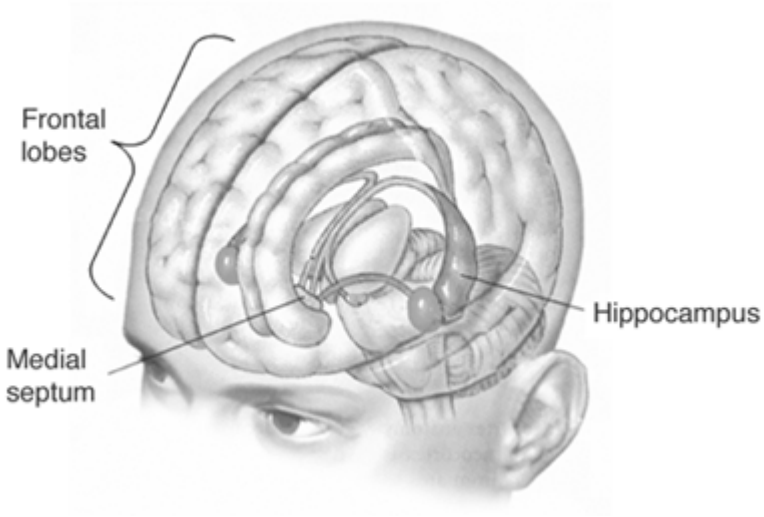
The Patients

HM underwent brain surgery in 1953 but a side-effect was damage to LTM. HM lost all memories of the two years up to the operation and many memories of the preceding decade. He also found it difficult to encode new LTM. However, although HM lost his episodic memory, he still had procedural memory (such as how to write) and could encode new procedural memories (he learned to play tennis – but he couldn't remember being taught it).

There were 14 patients in total. 3 (including HM) had brain damage to the hippocampus (part of the medial temporal lobe or MTL) from surgery or other injuries, 3 had brain damage

from viral infections (*herpes simplex encephalitis)* that was more widespread – these were MTL+. 8 of them were Controls who were healthy volunteers with no brain damage. They were matched with the patients in terms of age (70s) and education.

- Notice Schmolck's use of the Matched Pairs design. Each healthy Control was matched against a brain-damaged patient. This is important for any experiment with independent groups, but especially natural experiments where the researcher can't choose how to assign participants to conditions.
- Also notice the different types of brain damage. One of the problems with studying "lesions" (damage to parts of the brain) is that patients usually have lesions in several parts of the brain, not just one. The patients with viral brain damage had more extensive lesions than the patients (like HM) who had received surgery in just one part of the brain, the hippocampus.



Schmolck's Tests for Semantic Memory

Aim: To find out if Semantic LTM is linked to a particular part of the brain. If so, patients with lesions in that part of the brain should underperform at tests of Semantic LTM. Schmolck focused on damage to the medial temporal love (MTL).

IV: The extent of brain injury: (1) 3 patients with damage to Hippocampus/MTL only; (2) 3 patients with damage to MTL and the temporal cortex too (the MTL+ group); (3) a Control group with no brain damage.

Since the IV is naturally-varying and the Controls were matched on age and education, this is a natural experiment with Matched Pairs design.

In addition, Schmolck used different types of cognitive tests on the patients. The type of cognitive test is a Repeated Measures design because each participant did every test.

Since HM also had more widespread brain damage than the other Hippocampus/MTL patients (brought on perhaps by his earlier epilepsy, perhaps by the less accurate brain surgery in the 1950s) he was also

considered separately from the others.

DV: Scores on 9 separate tests of semantic LTM

Sample: 6 patients with severe damage to the MTL and 8 Controls with no brain damage. 3 of the patients also had damage to the temporal cortex generally.

Procedure: Schmolck created 9 tests for Semantic LTM functions. All were based on a set of 48 drawings, half of animals and half of objects. These pictures were grouped in sixes: 6 land animals, 6 birds, 6 musical instruments, 6 vehicles, etc. Here are some examples:

Picture test:

- **Similar pictures:** the participants are shown 6 pictures sharing a theme and asked to point out the one that the researcher names (this is testing for confusion caused by semantic similarity – similar to the Baddeley study)
- **Category fluency:** the participants were asked to give as many examples as possible from each theme within a minute
- **Category sorting:** the participants were given all 48 pictures and asked to sort them into "living" or "man made"
- **Definitions:** the participants were shown a picture and asked to define it by the theme it fitted into

Schmolck also used tests that are used with dementia patients. One of these involved 30 pictures that showed either real objects or non-objects: participants had to say whether the object in the picture was real or not.

The participants were tape recorded and their responses transcribed (typed up). 14 taters checked each transcript for reliability and also looked for grammar/syntax errors in the way the participants spoke.

Results: Schmolck collected scores for all 9 tests. Here are some examples of her findings:

- **Similar pictures:** the Controls got all the answers right as did those with hippocampus damage only (HM score 98% for living creatures and 100% for objects); MTL+ patient performed worse: 85% for living creatures and 90% for objects
- **MTL+:** These patients did significantly worse in all the tests ($p<0.005$)
- **HM:** HM did better than the MTL+ patients but slightly worse than the other patients with damage solely to the hippocampus
- **Overall:** Controls scored 99%, hippocampus-only patients scored 100% and MTL+ patients scored 78%

There was also a **correlation** between the amount of brain damage and the number of mistakes. The MTL+ patients made the most mistakes, followed by HM, then the hippocampus-only patients. Where the hippocampus-only patients did better than the Controls, Schmolck suggests it is because they were younger.

Conclusions: There seems to be a clear link between damage to the temporal cortex generally and the loss of semantic LTM. Patients with damage specific to the hippocampus suffered loss of episodic memory, but not semantic memory. This suggests that semantic and episodic LTM is encoded in different parts of the brain, with the hippocampus/MTL dealing with episodic memory and the nearby temporal cortex dealing with sematic memory.

Evaluating Schmolck et al.

Generalisability

Schmolck used a small sample – only 3 patients (including HM) with MTL/Hippocampus damage and 3 with wider temporal cortex damage. Samples this small are easily distorted by anomalies – and HM seems to have been the anomaly here.

However, Schmolck did single HM out an anomaly because of his wider brain damage and analysed his results in ore detail.

These sort of brain lesions and memory problems are relatively rare. HM suffered from serious epilepsy. The MTL+ patients all suffered from herpes which is a sexually transmitted disease. This might make them unrepresentative of the wider population.

Reliability

This is a good example of a reliable study because it has standardised procedures that could be replicated by other researchers. MRI scans are becoming common. Schmolck also used 14 rater to check the participants' scores and their agreement gives this study inter-rater reliability.

Nonetheless, the participants themselves are hard to replicate. HM died in 2005, so no more studies can be carried out on him.

Application

The main application of this study has been for other Cognitive Psychologists, who have built on Schmolck's research and earlier studies involving HM to understand the brain's role in memory. This is leading to the development of neurocognitive psychology – a mixing of the Cognitive and Biological approaches.

The study also helps us understand the risks of brain surgery and the side-effects of brain damage, which would enable doctors and patients to weigh up the risks of surgical procedures (HM might not have agreed to his surgery in 1953 if the consequences had been understood).

In the future, this sort of research may even lead to a cure for patients (like Clive Wearing) with this sort of memory loss if brain lesions can ever be repaired.

Validity

The use of healthy controls and the Matched Pairs design increases the validity of this study. It means we can be reasonably sure that the different scores on the tests were caused by the brain lesions in different parts of the brain, not by age or intelligence. This is backed up by the MRI scans which showed the temporal lobe area

activating when patients had to make semantic judgements.

However, the ecological validity of this study is not good. Naming and categorising drawings on cards is more like a game or a puzzle than the sort of memory you need in real life. It is an artificial test. Other studies (eg Teng & Squire, 1999) asked these patients to recall the neighbourhoods they grew up in and found they performed well at that.

Ethics

There are usually no significant ethical issues with Cognitive studies into memory. However, this study involved patients who could not give informed consent, because they would not be able to remember having the study explained to them. HM was studied all his adult life and could never consent to any of it, making him a human guinea pig. Increasingly, ethicists regard it as unacceptable to treat the lack of refusal as tacit consent.

However, the benefits to our scientific understanding of brain functioning from studying patients like HM have been so enormous, it may outweigh the lack of consent from these few, unusual patients.

EXAM STYLE ANSWER

Evaluate the contemporary study from cognitive psychology. (8 marks)

- *A 8-mark "evaluate" question awards 4 marks for AO1 (Describe) and 4 marks for AO3 (Evaluate).*

Description

Schmolck et al investigated patients with brain damage resulting in loss of LTM. One of the patients was HM who could not create new LTM after surgery. 2 others had damage to the hippocampus and 3 more had wider damage to the temporal cortex.

This was a natural experiment where the IV was the type of brain damage the participants had to do and the DV was their score on a test of Semantic LTM. There was also a control group of healthy adults.

The tests involved looking at 48 cards with drawings of animals or objects. The participants had to name the drawing or the category it was from (bird, vehicle, etc) or give other examples of animals or objects from these categories.

To get 4 marks for AO1, I'm making 4 clear and different points about Schmolck's study.

I'm writing 4 paragraphs, hoping to get a point for each.

(I've probably included more than I need in each paragraph – but I've made a point of including numbers to show I know *details* about the study)

Schmolck et al found that participants with damage to the hippocampus didn't suffer problems with these tests; they scored the same as (or better than) the Controls. HM scored a bit worse (only 98% on naming animals) but the patients with temporal cortex damage as well as damage to the medial temporal lobe (MTL+) scored much worse (average 78% on all tests).

Evaluation

Schmolck et al had a very reliable experiment. A lot of the tests had been used before with dementia patients and were easy to replicate. She also used 14 raters who studied transcripts of the answers. This gives the study inter-rater reliability.

Schmolck improved the validity of her study by using a control group of healthy adults the same age and educational background as the patients. This is Matched Pairs design. However, the MTL patients did slightly better than the Control group. Schmolck thought this was because they were younger and better educated so the matching wasn't perfect.

The study is valid because it is backed up by MRI brain scans which show the temporal cortex activating to do semantic tasks. This explains why the MRI+ group (with damage to the temporal cortex) scored lower at these tasks.

However, the tests lacked ecological validity because they were artificial. Instead of naming pictures of animals and household objects, the patients could have described their childhood memories like in the study by Teng & Squire (1999).

To get 4 marks for AO3, I'm making 4 clear and different points about evaluation issues.

Again, I'm writing 4 paragraphs, hoping to get a point for each.

(I've included some facts about the study here too but these are separate from the "description" above)

Conclusion

Schmolck et al designed a good study into semantic memory with patients suffering from an unusual condition. The patients were so unusual that it might be difficult to generalise the results. Now that HM is dead, no more research can be done on him. However, the insights into memory provided by his condition may one day help to cure memory loss and dementia which might make his terrible condition worthwhile.

To get into the top band (7-8 marks) I must remember to write a conclusion.

Notice that for a 8-mark answer you don't have to include *everything* Schmolck et al did. I haven't mentioned the ethical issues or the fact that the sample was too small. I haven't mentioned the scores in the most of the tests. I haven't described Schmolck's conclusions.

But I have tried to make the two halves – Description and Evaluation – evenly balanced.

The **Key Question** is a question about real life that Cognitive Psychology might answer.

In the exam you might be *given* a Key Question to think about along with a short passage describing it. Or you might be *asked* about the Key Question *you* have researched as part of the Cognitive Approach.

The Key Question presented here is:

How can psychologists' understanding of memory help patients with dementia?

Any exam question on this is going to be assessing AO2 (Application).

- If you are asked to summarise, outline or describe your Key Question, then the Examiner want you to outline the key features of dementia and perhaps some of the tests or therapies that are used to help sufferers. This is like general knowledge and you do not need to start using psychological terms or theories.
- If you are asked to use your knowledge of psychology to explain or answer the Key Question, this is where you will be applying theories of memory or the findings of famous studies to explain *why* dementia produces these symptoms or *how* the various tests or therapies work.
- Keep these two requirements firmly in your mind. They may be asked separately (for example, as two 4-mark questions) or combined together (as a single 8-mark question)

You can use the information on the following pages to summarise your Key Question. There is more here than you need. You may like to choose one aspect of the Key Issue that interests you – such as "dementia villages" like Hogeway – and follow them up in more detail. Internet links are provided to help you.

COGNITIVE KEY QUESTION: HOW CAN PSYCHOLOGY HELP WITH DEMENTIA?

Your suggested Key Question is:

How can Psychology help treat people suffering from dementia?

Remember it's a Key QUESTION. If the Examiner asks you what it is, don't write "Dementia". "Dementia" isn't a question. Questions have question marks at the end and start with a word like "how".

The exam may ask you to "summarise" your Key Question. This means giving some of the information below.

The Features of Dementia

Dementia is an illness that affects 850,000 people in the UK. It is set to rise to 1 million people by 2025. The most common cause of dementia is Alzheimer's. It tends to affect the elderly but there are 40,000 people under 65 in the UK with dementia.

The common symptoms of dementia include:

- Loss of memory
- Other cognitive deficits, like difficulty in understanding and confusion
- Depression
- Mood swings
- Exhaustion
- Ultimately, dementia is terminal

There is no cure for dementia but it is estimated that if we could delay the onset of dementia by five years, we would halve the number of deaths from dementia. Most research is into diagnosing dementia early, slowing down the onset of the disease and reducing the stress and unhappiness of sufferers.

"Features" means facts about your Key Issue – how common is it, who does it affect, what are the symptoms?

(You're not talking any Psychology here. It's general knowledge really)

Later you can explain the memory psychology behind the loss of declarative and procedural memory.

Diagnosing Dementia

Dementia often creeps up on people because they expect to have memory problems as they get older so they don't notice the symptoms until the disease is quite far advanced.

Prof. Bruno at Liverpool Hope University has developed a test to diagnose dementia before the effects start to show themselves.

His patients do a word recall test from a list of 15 words.

Normal memory should recall many of the first 4 words from the list but some patients recalled words from the middle of the list instead. These patients turned out to be much more likely to develop dementia.

Bruno makes a distinction between "healthy" memory loss from old age and "**pathological**" memory loss that his test seems to detect.

Prof. Bruno hopes tests like this will help pick up a warning sign of dementia before sufferers realise there is anything wrong with their memories.

Prof. Bruno's study is described in a short Youtube video

https://www.youtube.com/watch?v=Imp7RbS8HFg

Describing Prof. Bruno's test would be good if you can go on to explain the memory psychology behind it.

Cognitive Stimulation

This therapy for dementia stimulates the mind. It involves patients getting together in groups to discuss, play games and solve puzzles. Often the activities are linked to memories, like looking at old photographs, listening to old songs or using old skills (such as skittles).

Cognitive Stimulation works best for patients in the mild to moderate stages of dementia. It can slow down the progress of the disease as well as reduce stress and loneliness.

Variations of Cognitive Stimulation involve using music or introducing patients to pets. A charming version of this is in Seattle where the 400 residents of **The Mount** meet up with 150 kindergarten children 5 days a week. Staff report that the residents become lucid when they play with the children and join in their games and storytelling. They refer to this as "***moments of grace***".

This website describes the kindergarten at the Mount and includes a video

https://au.news.yahoo.com/sunday-night/features/a/28767461/what-happens-when-you-mix-a-nursing-home-with-childcare/

There's also a 2014 documentary called *Present Perfect*

The Dementia Village

Hogeway is a care home in the Netherlands for elderly with extreme dementia. Most are over the age of 80. Hogeway is unusual because the patients live nearly normal lives there. There are no locked doors and residents (they are never called 'patients') are free to wander about: join clubs, go for beauty treatment, perform music, play bingo, take walks.

Different parts of the village look like different types of homes – upper class with lace and chandeliers, cultural with books and art, urban with pop radio and cafes. All the waiters and shopkeepers are actually nurses and orderlies.

Hogeway is a type of **Validation Therapy**. Rather than continually being told they are wrong and deluded about things, the residents are allowed to live out their imagined life. This reduces stress and keeps the residents active, so that they need less medication and are more fit than most dementia sufferers.

There are several documentaries about Hogeway such as this BBC video

http://www.bbc.co.uk/news/health-20727157

Describing Hogeway would be good if you go on to discuss the psychology behind Validation Therapy and the ethical debate it creates

Applying Psychology to the Key Question

Any question on your Key Question will be assessing you on AO2 (Application of Concepts and Ideas) so as well as telling the Examiner *about* dementia and its treatment, you need to explain the psychology *behind* these ideas.

You might get a question in two parts: one part asking you to summarise your Key Quest and then another part asking you to use your psychological knowledge (the "apply" command from AO2).

Or you might get one question which asks you to explain and apply psychology to your Key Question: in this case, it's a good idea to write the answer in two "halves", getting all the explanation out of the way then dealing with the AO2 application.

Features

Dementia involves loss of memory but sufferers don't lose *all* their memories. They often lose memories of events from in their past. Tulving's ideas about episodic LTM apply to this. More recent episodic memories are lost first, but sufferers often keep memories from their youth or childhood right to the end.

Semantic memory seems to be lost separately, because sufferers may recognise a friend but forget their name. Schmolck et al's study into semantic LTM applies to this, because they found semantic LTM is stored in a different part of the brain.

Procedural memory is also affected separately. It may explain the confusion sufferers experience because they are suddenly unable to do tasks they have taken for granted, like read, tell the time or use a phone.

Diagnosis

Displacement theory applies Prof. Bruno's test. The primacy effect means the early items in a list are well-rehearsed and go into LTM, making them easy to recall. Middle items are displaced because there is no time to rehearse them. This happens because STM has a maximum capacity of 9 items. If a person doesn't experience displacement, it means that they weren't rehearsing the primacy items. This suggests a problem with LTM which Prof. Bruno calls "pathological".

Cognitive Stimulation

Cognitive Stimulation often starts by focussing on early memories from childhood and young adulthood. Most dementia sufferers will be able to access these episodic memories.

Semantic memory can help link episodic memories together, enabling sufferers to retrieve more and more details from LTM. Activities rehearse procedural memories that are fading.

The idea of Reconstructive Memory can be applied to this therapy. If memories are reconstructed using schemas, anything that reinstates schemas will help with memory. A lot of elderly people find themselves cut off from familiar things. The kindergarten at The Mount may remind sufferers of when they had children or when they were children themselves, activating schemas.

Validation Therapy

Reconstructive Memory can be applied to the dementia village at Hogeway. Each of the different parts of the village (cultural, urban, etc) corresponds to a different set of schemas. Someone who grew up in a wealthy home will have schemas corresponding to the high class part of Hogeway and find it easier to remember things like episodes and procedures. This makes it possible for them to be active and fit. This is in contrast to normal hospitals which are strange places for most patients, who take to their beds and decline.

Tulving's ideas of episodic and semantic LTM also apply to Hogeway. Because recent episodic memory is lost, sufferers often "live in the past" and find their present situation distressing. Staff do not contradict the residents but "go with" their beliefs and behaviour instead.

This is controversial. Some critics say that psychologists have an ethical duty not to deceive people. Hogeway is a giant deception designed to put dementia sufferers at ease.

EXAM STYLE ANSWER

Summarise the key question you have studied from Cognitive Psychology, using your knowledge of memory. (8 marks)

- *A 8-mark "evaluate" question awards 4 marks for summarising and 4 marks for AO2 (Apply).*

The Key Question

My Key Question was "How can Cognitive Psychology help people suffering from dementia?"

Summary

Dementia is a disease affecting 850,000 people in the UK. The most common type is Alzheimer's. It causes loss of memory, confusion and depression. There is no cure.

Despite this, sufferers can be helped if they are diagnosed early. Prof. Bruno has a test that picks up the warning signs of dementia. Patients to a word recall test of 15 words. If they don't recall the "primacy" words from the start of the list, this often predicts they will get dementia in the next few years.

Cognitive Stimulation can help dementia sufferers. This involves discussions and activities like singing and games. One treatment from America involves bringing a kindergarten into a residential home so that the sufferers can play with the children.

Validation Therapy is another approach. Hogeway is a "dementia village" where the residents can "live in the past" without being contradicted or confused. Different parts of the village resemble different lifestyles the residents had when they were younger. The residents are healthier and more mentally alert than normal sufferers.

To get 4 marks for AO1, I'm making 4 clear and different points about dementia.

I'm writing 4 paragraphs, hoping to get a point for each.

(I've probably included more than I need in each paragraph – I could have made 3 or 2 points in detail rather than 4)

Note: don't talk about HM or Clive Wearing. They had brain damage, not dementia

Application

Tulving's Episodic LTM can be applied to dementia. Dementia sufferers tend to lose recent episodic memory then the disease "works backwards" until they only remember episodes from youth. You may distress sufferers if you draw attention to what they have forgotten.

Displacement Theory can be applied to Prof. Bruno's test. In healthy memories the primacy words should be recalled best. In "pathological" memories, these words are not rehearsed into LTM. This helps diagnose dementia before other symptoms show.

Semantic memory can be applied to Cognitive Stimulation. The kindergarten seems to work because the sufferers have memories of when their own children are young. This gives

To get 4 marks for AO3, I'm making 4 clear and different points about evaluation issues.

Again, I'm writing 4 paragraphs, hoping to get a point for each.

I could have written more about 2 or 3 points, rather than 4 different points.

(I've started each point off with "X can be applied to Y")

them “moments of grace” when they remember things.

Reconstructive Memory can be applied to Hogeway because different parts of the village link to different schemas. The residents can be active and calm if they are surrounded by a familiar schema from their youth.

Conclusion

Cognitive Psychology cannot cure dementia but it can reduce the severity of the symptoms by diagnosing it early and slowing the disease down. There is an ethical debate about whether sufferers should be helped to cope with the world as-it-is or encouraged to live in the past. The evidence suggests villages like Hogeway help sufferers live longer, healthier lives even if they are deceived.

To get into the top band (7-8 marks) I must remember to write a conclusion.

Notice that for a 8-mark answer you don’t have to include *everything* about dementia. I haven’t mentioned the other symptoms or the precise details of Bruno’s test. I haven’t mentioned the examples from Hogeway or the name of the residential home with a kindergarten. I haven’t described any studies.

But I have tried to make the two halves – Summary and Application – evenly balanced.