The Holy Family Catholic School

A Level Psychology:

Transition Work

Completing the following activities will help you decide whether A Level Psychology is the right subject for you. These activities will also provide you with some essential knowledge that will ensure your transition to the subject is as smooth as possible. If you need any help or support with the activities you can find Mr Riley in the sixth form office or email your questions to priley@holyfamilyschool.uk.

An introduction to psychology:

Given the richness and complexity of behaviour, psychologists have evolved different approaches to understanding and explaining behaviour. Ideally, we would have one simple set of principles which would explain every aspect of human experience. At present, no such theory has been developed which has been met with broad acceptance. Instead, there are several different approaches which differ from each other in terms of their basic assumptions, methods and theoretical structures. Throughout the A level course, you will explore the five dominant approaches and their explanation of various types of behaviour. The five dominant approaches are (and in the order of their development); the Psychodynamic approach, Behavioural approach, Humanistic approach, Cognitive approach and Biological approach. For the purposes of this transition work, we will focus on the Cognitive approach (which is now often commonly referred to as ‘Cognitive Neuroscience’).

An Introduction to Cognitive Psychology

Cognitive psychologists believe that brain works like a supercomputer. They believe that all behaviour is the result of internal processing, organisation and interpretation of information collected via our senses. To study the brain and understand behaviour, we must consider three important elements: ‘Input, Process and Output’. ‘Input’ refers to the environment, situations and events that happen prior to behaviour being displayed. For example, what events have resulted in you completing this transition work? ‘Output’ in the observable behaviour or self-reported thoughts and feelings of an individual. These are determined by the ‘Processing’ that occurs within the brain. We cannot physically see how the brain processes information, so a cognitive psychologist will make an **inference** or assumption based upon the environmental factors and observable/self-reported behaviour. For example:

INPUT

You see someone slip and fall.

PROCESS

You process this information and consider lots of factors such as, the individual, the potential injury, the reaction of the individual, past experiences you have had.

OUTPUT

You then display the behaviour depending on your processing. Do you laugh or show concern?

<u>Activity 1: Attention</u>

Watch the following video about the importance of attention and our ability to multi-task.

(https://www.youtube.com/watch?v=tMiyzuO1qMs&list=PLuyE044xGW7-CE4eTYB-mbytPNyanufEw&index=3&t=0s)

1) In your own words, explain what is meant by the term *'inattention blindness'.*

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Want to know more about the Gorilla experiment? - http://www.theinvisiblegorilla.com/gorilla_experiment.html

2) Read the scenario before and give advice to Lucy. Try to use some of the key terms from earlier to support your advice.

Lucy is revising for her GCSE Biology exam with her friend Katie. Both girls decide that to put a film on in the background whilst they study. Both girls have previously seen the film so are not concern that is might affect their revision. During their revision session, Lucy frequently texts her boyfriend who she will be seeing in the evening.

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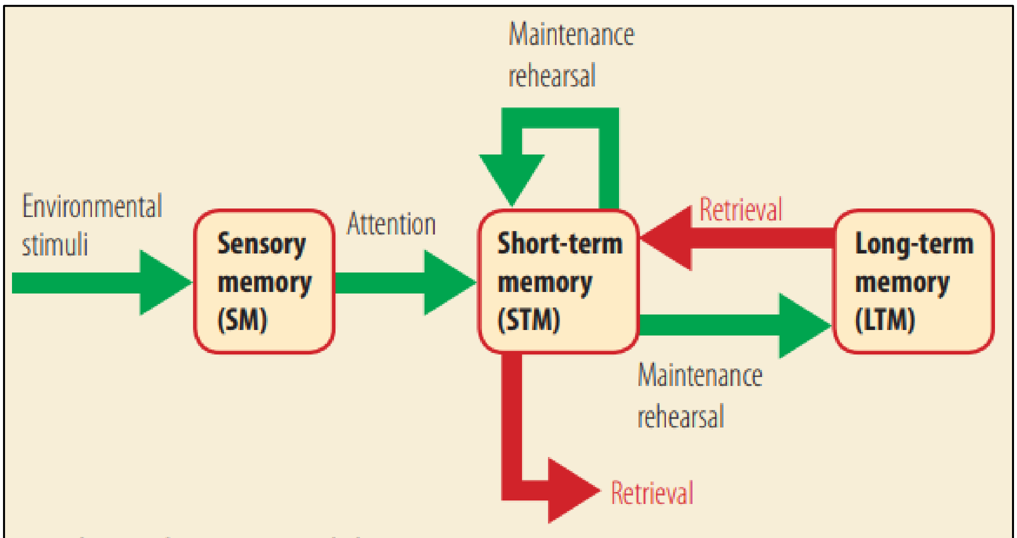
Selective attention or 'inattention blindness' does not only affect our ability to multi-task. It is also significant in our ability to create new memories. The process of creating new memories is called **encoding**. Encoding (or coding) is when the brain changes information so that it can be stored as a memory. Paying attention to something is essential for encoding to take place. Look at the theory of memory below proposed by Atkinson and Shiffrin (1968). They suggest that there are three components or stores of memory: Sensory Store, Short-term Store and Long-term Store.



▲ The multi-store model (Atkinson and Shiffrin, 1968).

As you can see from the diagram left, attention is essential to transfer information from our Sensory store (eyes, ears, nose etc.) to our short-term memory. By paying attention, we encode the information from our senses and turn the information into acoustic or visual images for storage.

<u>Activity 2:</u>

Read through the following information and see if you can answer the questions below. This information is taken from an A level textbook that we frequently use during the course. (page 46 / 47)

Short- and long-term memory

Your memory for events in the present or immediate past (e.g. trying to remember an order of drinks at the bar) is referred to as your **short-term memory** (or STM). Your memory for events that have happened in the more distant past (such as remembering this distinction between STM and LTM in an exam) is referred to as your **long-term memory** (or LTM).

STM and LTM are often distinguished in terms of their **capacity**, **duration** and **coding**.

TRY THIS

Cover all of the columns except the first and say the digits, then shut your eyes and recall them. Were you right? (Of course you were.) Now try it with five digits. Keep going until you don't get them right.

How many digits could you recall correctly? This is the capacity of your immediate or short-term memory. The technique for assessing this is called the digit span technique.

2	4	7	3	4	8	
4	5	4	5	1	1	
8	6	5	6	3	6	
1	2	8	4	6	3	
	9	2	8	5	6	
		4	7	8	5	
			5	9	9	
				3	1	
					2	

CAPACITY

Capacity concerns how much data can be held in a memory store. STM is a limited capacity store whereas LTM has a potentially infinite capacity.

The capacity of STM

The capacity of STM can be assessed using digit span (see 'Try this' above). In one of the earliest studies in psychology, Joseph Jacobs (1887) used this technique to assess STM capacity. He found that the average span for digits was 9.3 items and 7.3 for letters. Why was it easier to recall digits? Jacobs suggests that it may be because there are only nine digits whereas there are 26 letters.

The magic number 7 ± 2

George Miller (1956) wrote a memorable article called *The magic number seven plus or minus two*, in which he reviewed psychological research and concluded that the span of immediate memory is about seven items – sometimes a bit more, sometimes a bit less. He noted that people can count seven dots flashed onto a screen but not many more (see 'Try this' at the top of the facing page). The same is true if you are asked to recall musical notes, letters and even words. Miller also found that people can recall five words as well as they can recall five letters – we chunk things together and can then remember more.

EVALUATION/DISCUSSION

The capacity of STM may be even more limited

One criticism of the research investigating STM is that Miller's original findings have not been replicated.

Cowan (2001) reviewed a variety of studies on the capacity of STM and concluded that STM is likely to be limited to about four chunks. Research on the capacity of STM for visual information (rather than verbal stimuli) also found that four items was about the limit (e.g. Vogel *et al.*, 2001). This means that the lower end of Miller's range is more appropriate (i.e. 7 – 2 which is 5).

This suggests that STM may not be as extensive as was thought.

The size of the chunk matters

It seems that the size of the chunk affects how many chunks you can remember.

Simon (1974) found that people had a shorter memory span for larger chunks, such as eight-word phrases, than smaller chunks, such as one-syllable words.

This continues to support the view that STM has a limited capacity and refines our understanding.

A03 plus Individual differences

The capacity of STM is not the same for everyone.

Jacobs also found that recall (digit span) increased steadily with age; eight year olds could remember an average of 6.6 digits whereas the mean for 19 year olds was 8.6 digits. This age increase might be due to changes in brain capacity, and/or to the development of strategies such as chunking.

This suggests that the capacity of STM is not fixed and individual differences may play a role.

DURATION

LTM potentially lasts forever but STM doesn't last very long – it has a short duration, unless you repeat the items over and over again.

The duration of STM

Lloyd Peterson and Margaret Peterson (1959) studied the duration of STM, using 24 students. Each participant was tested over eight trials. On each trial a participant was given a consonant syllable and a three-digit number (e.g. THX 512). They were asked to recall the consonant syllable after a retention interval of 3, 6, 9, 12, 15 or 18 seconds. During the retention interval they had to count backwards from their three-digit number.

Participants, on average, were 90% correct over 3 seconds, 20% correct after 9 seconds and only 2% correct after 18 seconds. This suggests that STM has a very short duration – less than 18 seconds – as long as verbal rehearsal is prevented.

The duration of LTM

Harry Bahrick *et al.* (1975) tested 400 people of various ages (17–74) on their memory of classmates. A photo-recognition test consisted of 50 photos, some from the participant's high-school yearbook. In a free-recall test participants were asked to list the names they could remember of those in their graduating class.

Participants who were tested within 15 years of graduation were about 90% accurate in identifying faces. After 48 years, this declined to about 70% for photo recognition. Free recall was about 60% accurate after 15 years, dropping to 30% after 48 years.

EVALUATION/DISCUSSION

Testing STM was artificial

Another criticism of research investigating STM is that it is artificial.

Trying to memorise consonant syllables does not truly reflect most everyday memory activities where what we are trying to remember is meaningful. However, we do sometimes try to remember fairly meaningless things, such as groups of numbers (phone numbers) or letters (postcodes).

This means that, although the task was artificial, the study does have some relevance to everyday life.

STM results may be due to displacement

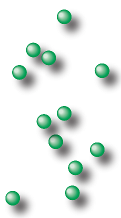
A criticism of the Petersons' study is that it did not actually measure what it set out to measure.

In the Petersons' study participants were counting the numbers in their STM and this may displace or 'overwrite' the syllables to be remembered. Reitman (1974) used auditory tones instead of numbers so that displacement wouldn't occur (sounds don't interfere with verbal rehearsal) and found that the duration of STM was longer.

This suggests that forgetting in the Petersons' study was due to displacement rather than decay.

TRY THIS

Cover up the picture below. How many dots were there? The capacity of STM is probably fewer than nine items, which would predict that you wouldn't get the answer right because there were 12 dots. If there were five dots you would probably have coped.



KEY TERMS

Capacity This is a measure of how much can be held in memory. It is represented in terms of bits of information, such as number of digits.

Coding (also 'encoding') The way information is changed so that it can be stored in memory. Information enters the brain via the senses (e.g. eyes and ears). It is then stored in various forms, such as visual codes (like a picture), acoustic codes (sounds) or semantic codes (the meaning of the experience).

Duration A measure of how long a memory lasts before it is no longer available.

Long-term memory (LTM) Your memory for events that have happened in the past. This lasts anywhere from 2 minutes to 100 years. LTM has potentially unlimited duration and capacity and tends to be coded semantically.

Short-term memory (STM) Your memory for immediate events. STMs are measured in seconds and minutes rather than hours and days, i.e. a short duration. They disappear unless they are rehearsed. STM also has a limited capacity of about four items or chunks and tends to be coded acoustically. This type of memory is sometimes referred to as working memory.

CODING

Information that we store has to be 'written' in memory in some form – it is described as a 'code' in which it is held in the form of sounds (acoustic), images (visual) or meaning (semantic).

Acoustic and semantic coding

- The following words are acoustically similar but semantically different: cat, cab, can, cad, cap, mad, max, mat, man, map.
- The following words are the opposite – semantically similar but acoustically different: great, large, big, huge, broad, long, tall, fat, wide, high.

Alan Baddeley (1966a and 1966b) used word lists like those above to test the effects of acoustic and semantic similarity on STM and LTM. He found that participants had difficulty remembering acoustically similar words in STM but not in LTM, whereas semantically similar words posed little problem for STMs but led to muddled LTMs.

This suggests that STM is largely encoded acoustically whereas LTM is largely encoded semantically.

EVALUATION/DISCUSSION

STM may not be exclusively acoustic

Some experiments have shown that visual codes are also used in STM.

For example, Brandimote *et al.* (1992) found that participants used visual coding in STM if they were given a visual task (pictures) and prevented from doing any verbal rehearsal in the retention interval (they had to say 'la la la') before performing a visual recall task. Normally we 'translate' visual images into verbal codes in STM but, as verbal rehearsal was prevented, participants used visual codes. Other research has shown that STM sometimes uses a semantic code (Wickens *et al.*, 1976).

This suggests that STM is not exclusively acoustic.

LTM may not be exclusively semantic

In general LTM appears to be semantic but not always.

Frost (1972) showed that long-term recall was related to visual as well as semantic categories, and Nelson and Rothbart (1972) found evidence of acoustic coding in LTM.

Therefore it seems that coding in LTM is not simply semantic but can vary according to circumstances.

A03 plus Baddeley may not have tested LTM

Baddeley's methodology has been criticised.

In the study by Baddeley, STM was tested by asking participants to recall a word list immediately after hearing it. LTM was tested by waiting 20 minutes. It is questionable as to whether this is really testing LTM.

This casts doubt on the validity of Baddeley's research because he wasn't testing LTM after all.

Research methods

A Russian psychologist, Bluma Zeigarnik, challenged the rather neat idea of STM versus LTM memories. Maybe it isn't so simple. For example, in a restaurant a waiter remembers who ordered what for more than five minutes but forgets it as soon as the orders are served. Zeigarnik (1927) tested this in a lab by asking participants to do about 20 little tasks, such as solving puzzles and stringing beads. On some occasions participants were interrupted halfway through the task. The interesting thing was that participants were about twice as likely to remember the tasks during which they'd been interrupted than those they completed. This suggests that we forget things when the 'I have completed this task' switch is flicked, but otherwise it continues in our longer-term memories.

1. Explain why this might be considered to be a repeated measures experiment. (2 marks)
2. Identify the dependent variable in this study. (1 mark)
3. This study is a laboratory experiment. Give **one** strength and **one** limitation of this kind of research in the context of this study. (2 marks + 2 marks)
4. If you were going to conduct this study, identify **two** things that participants would need to know beforehand in order to provide informed consent. (2 marks)

LINK TO RESEARCH METHODS

Repeated measures on page 184
Laboratory experiments on pages 186–187
Informed consent on page 194

◀ Bahrick *et al.*'s study (see facing page) demonstrated the considerable duration of LTM by asking people of various ages to put names to faces from their high-school yearbook. Forty-eight years on, people were about 70% accurate.

And just to prove that, here's a copy of Cara's high-school yearbook circa 1962 – good old Karen and Betsy.

CAN YOU? No. 2.1

1. Explain what is meant by the terms 'duration', 'capacity' and 'coding' in relation to memory. (2 marks each)
2. Describe and evaluate research that has investigated capacity in STM. (8 marks)
3. Describe and evaluate research that has investigated duration in STM and/or LTM. (10 marks)
4. Describe and evaluate research that has investigated coding in memory. (8 marks)

Questions:

1) **Explain the difference between capacity and duration in the context of memory.**

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2) **What is the capacity and duration of Short-term memory?**

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3) **What is the capacity and duration of Long-term memory?**

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4) **Can you explain what is meant by the term 'semantic encoding'?**

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The curious but complex nature of memory!

Watch the video below to see how bizarre and unreliable memory can be:

(https://www.youtube.com/watch?v=YYkIjy8sOmE&list=PluyE044xGW7-CE4eTYB-mbytPNyanufEw&index=1)

As you have seen in the video, our memory systems are extremely complex and still not fully understood. We do know from research that our memories are not direct recordings of events that have taken place. Instead, our memories are an interpretation of an event. This explains why two people who have witnessed the same event might recall the details differently. We also know that once a memory has been created and stored, it can still be changed by other people if they use **leading questions** or we experience similar events.

<u>Activity 3: Reconstructive Memory</u>

In A level Psychology, not only are you expected to know the findings of research and how they were conducted, you are also expected to be able to analyse results and understand data. Below is a replication of **Loftus and Palmer's (1974)** study into the effects of leading questions on memory recall. Read through the study and complete the data analysis questions.

10 participants were individually shown a video of a car crash. Five of the participants were then asked the following question, 'How fast was the car going before the accident?'. The other five participants were asked a leading question, purposefully used to influence their memory recall. The question was, 'How fast was the car going before it smashed into the other car?'. The estimated speed of from the 10 participants is below:

Group 1: No leading question		***Group 2: Leading question***	
Participant 1	*30 (mph)*	*Participant 6*	*35 (mph)*
Participant 2	*35 (mph)*	*Participant 7*	*40 (mph)*
Participant 3	*40 (mph)*	*Participant 8*	*35 (mph)*
Participant 4	*30 (mph)*	*Participant 9*	*45 (mph)*
Participant 5	*22 (mph)*	*Participant 10*	*38 (mph)*

Questions:

1) **Calculate the mean score for each group, write your answer as two significant figures.**

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2) **Use the mean scores to write a conclusion about what the findings suggest.**

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3) **Calculate the range for each group.**

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4) **What does the range suggest about the answers given by participants in both groups?**

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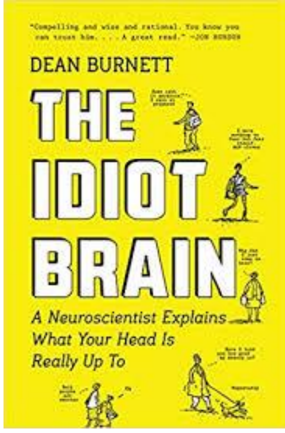
The Idiot Brain (Burnett, D. 2016)

Throughout the A Level course you will be expected and encouraged to complete wider reading around the topics covered in class. Cambridge University calls such activities 'Super-Curriculum' and research demonstrates how completing such activities significantly increases your understanding and exposes you to the language required to push your answers towards the top grades. Read the following few pages from *'The Idiot Brain'* by Dr Burnett and answer the following questions. (You can complete wider research on the internet to help)



Where am I? … Who am I? (When and how the memory system can go wrong)

In this chapter, we've covered some of the more impressive and outlandish properties of the brain's memory system, but all of these have assumed that the memory is working normally (for want of a better term). But what if things go wrong? What can happen to disrupt the brain's memory systems? We've seen that ego can distort your memory, but that it rarely if ever distorts so severely it actually creates new memories for things that didn't actually happen. This was an attempt to reassure you. Now let's undo that by pointing out that I didn't say it never happens. Take 'false memories'. False memories can be very dangerous, especially if they're a false memory of something awful. There have been reports of arguably well-intentioned psychologists and psychiatrists trying to uncover repressed memories in patients who have seemingly ended up creating (supposedly by accident) the terrible memories they're trying to 'uncover' in the first place. This is the psychological equivalent of poisoning the water supply. The most worrying thing is that you don't need to be suffering from psychological issues to have false memories created in your head; it can happen to virtually anyone. It might seem a bit ridiculous that someone can implant false memories in our brains by just talking to us, but neurologically it's not that far-fetched. Language is seemingly fundamental to our way of thinking, and we base much of our world view on what other people think of and tell us (see Chapter 7). Much of the research on false memories is focused on eyewitness testimonies. In important legal cases, innocent lives could be altered for ever by witnesses misremembering a single detail, or remembering something that didn't happen. Eyewitness accounts are valuable in court but that's one of the worst places to obtain them. It's often a very tense and intimidating atmosphere and the people testifying are made fully aware of the seriousness of the situation, promising to 'tell the truth, the whole truth and nothing but the truth, so help me God'. Promising a judge you won't lie and invoking the supreme creator of the universe to back you up? These aren't exactly casual circumstances, and probably will cause considerable stress and distraction. People tend to be very suggestive to those they recognise as authority figures, and one persistent finding is that when people are being quizzed about their memory, the nature of the question can have a major influence on what is remembered. The best-known name connected to this phenomenon is Professor Elizabeth Loftus, who has done extensive research into the subject. She herself regularly cites the worrying cases of individuals who have had extremely traumatic memories 'implanted' (presumably accidentally) by questionable and untested therapeutic methods. A particularly famous case involves Nadine Cool, a woman who sought therapy for a traumatic experience in the 1980s and ended up with detailed memories of being part of a murderous satanic cult. This never happened though, and she ended up successfully suing the therapist for millions of dollars. Professor Loftus's research details several studies where people are shown videos of car accidents or similar occurrences and then asked questions about what was observed. It's been persistently found (in these and other studies) that the structure of the questions asked directly influences what an individual can remember. Such an occurrence is especially relevant for eyewitness testimonies. In particular conditions, such as the individual being anxious and the question coming from someone with authority (say, the lawyer in a court room), specific wording can 'create' a memory. For example, if the lawyer asks, 'Was the defendant in the vicinity of the cheese shop at the time of the great cheddar robbery?', then the witness can answer yes or no, according to what he or she remembers. But if the lawyer asks, 'Where in the cheese shop was the defendant at the time of the great cheddar robbery?', this question asserts that the defendant was definitely there. The witness may not remember seeing the defendant, but the question, stated as a fact from a higher-status person, causes the brain to doubt its own records, and actually adjust them to conform to the new 'facts' presented by this 'reliable' source. The witness can end up saying something like, 'I think he was stood next to the gorgonzola', and mean it, even though he or she witnessed no such thing at the time. That something so fundamental to our society should have such a glaring vulnerability is disconcerting. I was once asked to testify in a court that all the witnesses for the prosecution could just be demonstrating false memories. I didn't do it, as I was worried I could inadvertently destroy the whole justice system.

We can see just how easy it is disrupt the memory when it's functioning normally. But what if something actually goes wrong with the brain mechanisms responsible for memory? There are a number of ways this can happen, none of which are particularly nice. At the extreme end of the scale, there's serious brain damage, such as that caused by aggressive neurodegenerative conditions such as Alzheimer's disease. Alzheimer's (and other forms of dementia) is the result of widespread cell death throughout the brain, causing many symptoms, but the best known is unpredictable memory loss and disruption. The exact reason this occurs is uncertain, but one main theory at present is that it's caused by neurofibrillary tangles. Neurons are long, branching cells, and they have what are basically 'skeletons' (called cytoskeletons) made of long protein chains. These long chains are called neurofilaments, and several neurofilaments combined into one 'stronger' structure, like the strands making up a rope, is a neurofibril. These provide structural support for the cell and help transport important substances along it. But, for some reason, in some people, these neurofibrils are no longer arranged in neat sequences, but end up tangled like a garden hose left unattended for five minutes. It could be a small but crucial mutation in a relevant gene causing the proteins to unfold in unpredictable ways; it could be some other currently unknown cellular process that gets more common as we age. Whatever the cause, this tangling seriously disrupts the workings of the neuron, choking off its essential processes, eventually causing it to die. And this happens throughout the brain, affecting almost all the areas involved in memory. However, damage to memory doesn't have to be caused by a problem that occurs at the cellular level. Stroke, a disturbance in the blood supply to the brain, is also particularly bad for memory; the hippocampus, responsible for encoding and processing all our memories at all times, is an incredibly resource-intensive neurological region, requiring an uninterrupted supply of nutrients and metabolites. Fuel, essentially. A stroke can cut off this supply, even briefly, which is a bit like pulling the battery out of a laptop. Brevity is irrelevant; the damage is done. The memory system won't be working so well from now on. Although there is some hope, in that it has to be a powerful or particularly precise stroke (blood has many ways of getting to the brain) to cause serious memory problems. There's a difference between ‘unilateral’ and ‘bilateral’ strokes. In simple terms, the brain has two hemispheres, both of which have a hippocampus; a stroke that affects both is pretty devastating, but a stroke that affects just one hemispheres is more manageable. Much has been learned about the memory system from subjects who have suffered varying memory deficits from strokes, or even weirdly precise injuries. One subject referenced in scientific studies on memory was an amnesia sufferer whose condition resulted from somehow getting a snooker cue lodged right up his nose to the point where it physically damaged his brain. There’s really no such thing as a ‘non-contact’ sport. There have even been cases where the memory-processing parts of the brain have been removed deliberately via surgery. This is how areas of the brain responsible for memory were recognised in the first place. In the days before brain scans and other flashy technology, there was Patient HM. Patient HM suffered severe temporal-lobe epilepsy, meaning the areas of his temporal lobe were causing debilitating fits so often that it was determined that they had to be removed. So they were, successfully, and the fits stopped. Unfortunately, so did his long-term memory. From then on, Patient HM could remember only the months leading up to surgery, and no more. He could remember things that happened to him less than a minute ago, but then he’d forget them. This is how it was established that the temporal lobe is where all the memory-formation workings are in the brain. Patients with hippocampal amnesia are still studied today, and the wider-reaching functions of the hippocampus is constantly being established. For example, a recent study from 2013 suggests that hippocampal damage impairs creative thinking ability. It makes sense; it must be harder to be creative if you can’t retain and access interesting memories and combinations of stimuli. Perhaps as interesting were the memory systems HM didn’t lose. He clearly retained his short-term memory, but information in short-term memory no longer had anywhere to go, so it faded away. He could learn new motor skills and abilities such as specific drawing techniques, but every time you tested him on a specific ability, he was convinced it was the first time he’d ever attempted it, despite being quite proficient at it. Clearly, this unconscious memory was processed elsewhere by different mechanisms that had been spared. Soap operas would lead you to believe that ‘retrograde amnesia’ is the most common occurrence, meaning an inability to recall memories acquired before a trauma occurs. This is typically demonstrated by a character receiving a blow to the head (he fell and hit it in an unlikely plot device), regaining consciousness and asking, ‘Where am I? Who are you people?’, before slowly revealing he can’t recall the past twenty years of his life. This is far more unlikely than TV implies; the whole blow-to-the-head-and-lose-whole-life-story-and-identity thing is very rare. Individual memories are spread throughout the brain, so any injury that actually destroys them is likely to destroy much of the whole brain as well. If this happens, remembering your best friend’s name probably isn’t a priority. Similarly, the executive regions in the frontal lobe responsible for recollection are also pretty important for things such as decision-making, reasoning etc., so if they’re disrupted then memory loss will be a relatively minor concern compared with the more pressing problems. People can and do demonstrate retrograde amnesia, but it is usually transient and memories eventually return. This doesn’t make for good dramatic plots, but it’s probably better for the individual. If and when retrograde amnesia does occur, the nature of the disorder means it’s very hard to study; it is difficult to assess and monitor the extent of someone’s memory loss from their earlier life, because how would you know anything about this time? The patient could say, ‘I think I remember going to the zoo on a bus when I was eleven’, and it seems as though their memory is returning, but unless the doctor was actually on the bus with them at the time, how can anyone be sure? It could easily be a suggested or created memory. So in order to test and measure someone’s memory loss from their earlier life, you’d need an accurate record of their whole life to measure any gaps or losses accurately, and having such a thing is rare. The study of one type of retrograde amnesia resulting from a condition known as Wernicke-Korsakoff syndrome, typically the result of thiamine deficiency due to excessive alcoholism, benefited from an individual known as 'Patient X', a sufferer who had previously written an autobiography. This enabled doctors to study the extent of his memory loss more precisely as they had a reference to go from. We might see this happening more in the future, with more and more people charting their lives online via social media sites. But then, what people do online isn't always an accurate reflection of their lives. You can imagine clinical psychologists accessing an amnesia patient's Facebook profile and assuming their memories should consist of mostly laughing at funny videos of cats. The hippocampus is easily disrupted or damaged – by physical trauma, stroke, various types of dementia. Even Herpes Simplex, the virus responsible for cold sores, can occasionally turn very aggressive and attack the hippocampus. And, of course, as the hippocampus is essential for the formation of new memories, the more likely type of amnesia is anterograde: the inability to form new memories following a trauma. This is the sort of amnesia Patient HM suffered from (he died in 2008 at the age of seventy-eight). If you saw the film Memento, it's just like that. If you saw the film Memento but don't really remember it, that's not quite so helpful (but is ironic). This is just a brief overview of the many things that can go wrong with the brain's memory processes, via injury, surgery, disease, drink, or anything else. Very specific types of amnesia can occur (for example, forgetting memory for events but not for facts) and some memory deficits have no recognisable physical cause (some amnesias are believed to be purely psychological, stemming from denial or reaction to traumatic experiences). How can such a convoluted, confusing, inconsistent, vulnerable and fragile system be of any use at all? Simply because, most of the time, it does work. It's still awesome, with a capacity and adaptability that puts even the most modern supercomputers to shame. The inherent flexibility and weird organisation is something that's evolved over millions of years, so who am I to criticise? Human memory isn't perfect, but it's good enough.

Questions:

1) **Which area of the brain 'encodes' and is responsible for processing all types of memory?**

2) **Why did the patient Henry Molaison (H.M) have surgery to remove part of his temporal lobe?**

3) **Can you explain how Henry Molasion's memory was affected by the surgery and which parts of his memory remain unaffected?**

4) **Can you explain what is meant by the term 'Retrograde Amnesia' and why it is so difficult to study?** *(Can you see why 'Patient X' gave a unique opportunity to study this type of memory loss?)*

5) **Both H.M and Patient X are considered 'Case Studies' in terms of the methods used to study their behaviour. Can you explain in your own words what is meant by a Case Study?**

If you would to complete more research around such topics before starting the course, then please see Mr Riley and he will provide you with additional reading or documentaries to help.

Key Term Glossary

Complete the table below as a final activity. All of the key terms are contained or referenced in this booklet. This glossary will be useful when studying Memory in Paper 01.

Key Term	Definition
Inference	
Encoding (Coding)	
Capacity	
Leading Questions	
Eyewitness Testimony	
Hippocampus	
Case Study	
Retrograde Amnesia	
Sensory Memory Store	