

Starters and Plenaries for AS and A Level Edexcel Psychology

Topic 2: Cognitive Psychology

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Teacher's Introduction

What does this pack contain?

This pack contains starter and plenary activities for Topic 2 of the Edexcel Level 3 Advanced GCE in Psychology (9PS0) specification. It is specifically for the new 2015 specification. The pack is focused on cognitive psychology and has activities which cover the entire topic.

How do I use this resource?

These activities are aimed at providing very quick ways of engaging students in learning at the start of a lesson. They may also be appropriate for use at midway points. They are designed for use in the classroom but some could be set as homework tasks. Activities take very little time to prepare and photocopy.

Tasks are clear and simple, making each activity self-explanatory for ease of use. They are designed for activities to be used in a way which suits the class best. They can be used as individual or group tasks.

Most activities are differentiated, with Stretch and Challenge Tasks for the more-able students.

Answers to each activity are provided at the end of this pack. The answers provided are not exhaustive or prescriptive. Variations of the answers, or other valid answers, are encouraged.

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How Activities Link to the Specification and Assessment

This table shows how each activity relates to the specification and which assessment objectives are covered in each activity. Indicated AOs include Stretch and Challenge Tasks.

Activity Number	Topic	Reference to Specification	Activities
1	WMM	2.1.1	Diagram and State Organiser
2	Evidence for the WMM	2.1.1	Picture Links
3	Sensory, Short-term and Long-term Memory	2.1.2	Stimulus Interpretation
4	Information Processing	2.1.2	Grid Fill and State Organiser
5	Multi Store Model Evaluation	2.1.2	Graph Interpretation
6	Types of Long-term Memory	2.1.3	Definitions and Examples
7	Schema	2.1.4	Red Herring Gap
8	Reconstructive Memory	2.1.4	Peer Assessment
9	Individual Differences in Processing Speed	2.1.5	Lucky Dip
10	Individual Differences in Schema	2.1.5	Learning Detection
11	Autobiographical Memory	2.1.5	Elaboration
12	Dyslexia and Children's Memory	2.1.6	True or False
13	Alzheimer's and Memory in Older People	2.1.6	Symptom Interpretation
14	Brain Damage Study	2.2.13	Dominoes
15	Baddeley (1966b)	2.3.1	Study Deconstruction

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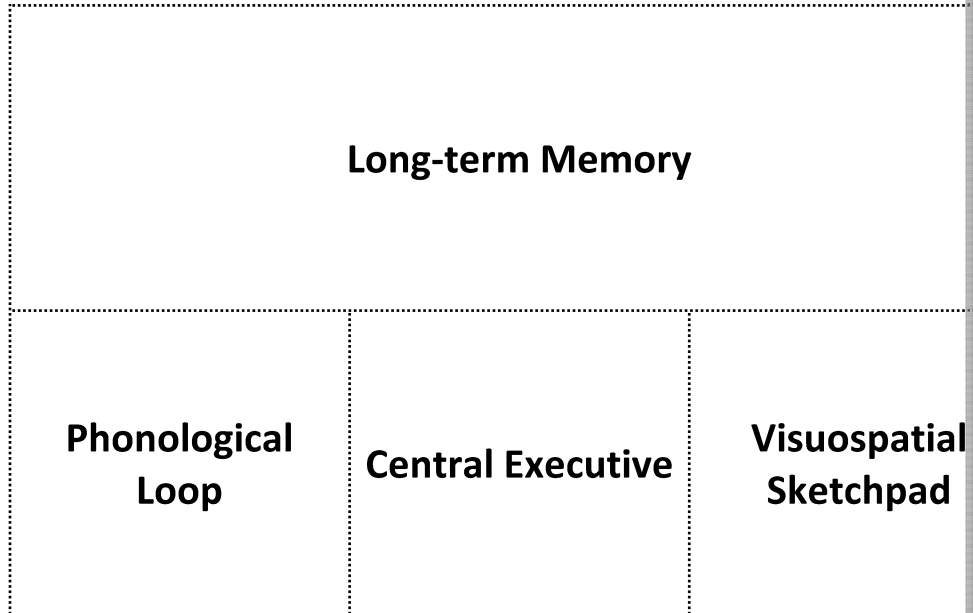


Activity Number	Topic	Reference to Specification	Activities	AO1	AO2	AO3
	Schmolck et al (2002)	2.3.2	Study Post-its	✓		✓
	Steyvers and Hemmer (2012)	2.3.3	Study Post-its	✓		✓
	Sebastián and Hernández-Gill (2012)	2.3.4	Study Post-its	✓		✓
	Ethics in Cognitive Research	2.6	Consent Form			✓
	Practical Issues in the Design and Implementation of Research	2.6	Spot the Mistake			✓
	Reductionism in Cognitive Research	2.6	Format Converter			✓
	Comparisons between Theories of Memory	2.6	Compare and Contrast			✓
	Is Cognitive Research Scientific?	2.6	Cued Debates			✓
	Nature and Nurture in Cognitive Research	2.6	Highlighter			✓
	How Has knowledge of Memory Developed over Time?	2.6	Storyboard			✓
	Memory research and social control	2.6	Criminal Case		✓	✓
	How Can We Use Knowledge of Memory in Real Life?	2.6	Grid Fill		✓	✓
	Socially Sensitive Research	2.6	Cost–benefit Analysis			✓
	All	All	Trivial Pursuit	✓	✓	✓
	All	All	Class Quiz	✓	✓	✓

Activity 1: Working Memory Model

Task 1

Cut out the memory stores below and arrange them so that they form the working memory model. Once you have done this and it has been checked by the teacher, stick it into your folder to keep in your folder.



Task 2

Draw arrows between the stores to show how information flows through the memory system.

Task 3

Draw a square around the parts which form the short-term memory.

Stretch and Challenge Task

Read the statements below and indicate which store they are describing by writing the store (e.g. CE, PL, VSS, EB) next to each statement. Stick your answers into your folder to keep in your folder.

- a) Represents the inner voice (articulatory process)
- b) Has a limited capacity
- c) Key component of the working memory
- d) Integrates information from all other stores
- e) Represents the inner eye
- f) Decides where data should be sent
- g) Deals with auditory information
- h) Used for planning spatial tasks
- i) Deals with visual information
- j) Data from the sensory memory arrives here first
- k) Represents the inner ear (phonological store)
- l) Can temporarily store visual and acoustic information

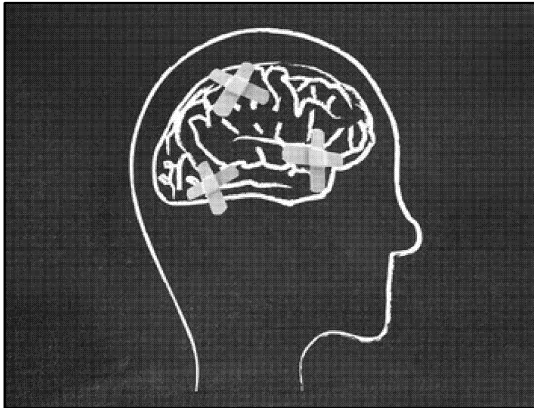
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Activity 2: Working Memory Model

Look at the pictures below and explain how each one can be used as evidence for model.



Brain Damage

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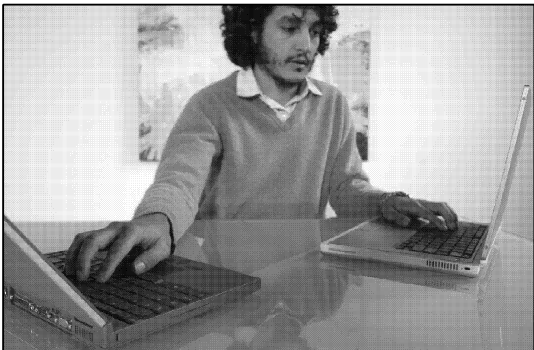
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Dual Task Studies

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Brain Scans

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Stretch and Challenge Task

Evaluate the quality of each of the sources of evidence.

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Activity 3: Sensory, Short-term and Long-term

Read the scenarios below and identify what type of memory each is referring to.

Lucy's PE teacher asked her to take a message to reception. Unfortunately, as she didn't have a pen or paper. The teacher told Lucy the short message and told her to go to reception she repeated the message over and over so that she wouldn't forget to tell the receptionist the correct information.

a) The type of memory being referred to is

Stretch and Challenge Task

Identify and explain the process that Lucy is using to remember the information

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Benny was interested in film. Before the digital era, films were made up of lots of stills presented so quickly that they looked as if they were moving. As Benny looked at a film he saw everything and everyone moving really smoothly he realised that this is how

b) The type of memory being referred to is

Stretch and Challenge Task

What is the process that Benny is thinking about?

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Carly was talking to her mum about what she wanted for her birthday. This was the first time of the year and she always got very excited about it. Every year she would look at the presents she had for her last birthday so that she could decide on something better for this year.

c) The type of memory being referred to is

Stretch and Challenge Task

Carly is actually using two memory stores. Describe why this is the case.

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Activity 4: Information Process

Memory Store	Description	Storage Capacity	Storage Duration	
Sensory Memory				
Short-term Memory				
Long-term Memory				

Task 1

Write the following points into the correct box on the grid. Do **NOT** use the descr

Fractions of a second	Potentially limitless	Up to a lifetime	Rehearsal	S
Visual and acoustic	Very limited	No encoding	7 +/- 2	18

Task 2

The following are statements **describing** the memory stores. Write the letter of e box on the grid.

- Stores info for brief period.
- Includes personal memories, general knowledge and beliefs about the world.
- Allows visual continuity.
- Represents psychological past.
- Temporary storage for incoming info.
- Represents psychological present.
- Holds sensory info in an unprocessed form.

Task 3

Read each piece of text describing retrieval processes then identify which memon each case.

Information may be stored in separate fragments and so when retrieving we ne to access all parts of it to get the full memory trace. When we can only access o part of it we have what is known as the 'tip of the tongue' phenomena.

Information may be rehearsed to keep it for long enough so that we can quickly scan it and recall it (retrieval). Old or weak memory traces are displaced by new information and so are forgotten.

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Activity 5: Multi Store Model Evidence

Glanzer and Cunitz (1966) conducted a study examining the idea of separate memory stores.

Participants were presented with a list of words and then asked to recall them immediately or after doing the Peterson and Peterson distraction task for 30 seconds.

Look at the Glanzer and Cunitz results below and then answer the questions.

- a) What is the main difference in the recall performance of the two groups?

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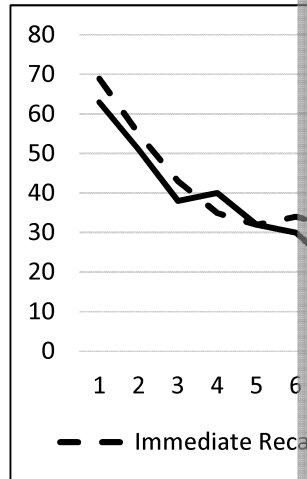
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- b) What is a possible explanation of the difference in the way that the two groups recall the words?

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- c) Do these results provide evidence that supports or challenges the multi store model of memory? Justify your answer.

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Stretch and Challenge Task

Apply the reductionism debate to the multi store model. Write an evaluative paragraph of no more than 100 words.

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Activity 6: Types of Long-term Memory

Write a definition of and give an example for each type of long-term memory.

Episodic Memory

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Example:

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Semantic Memory

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Example:

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Stretch and Challenge Task

It is believed that, when compared to episodic memory, the memory traces in semantic memory are more stable and are less vulnerable to being changed by schema or misleading information. This is why semantic memory can be used in a court case where evidence was being presented from an eyewitness.

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Activity 7: Schema Theory

Fill in the gaps using the words in the box below. But be careful, there are more words than gaps. Identify the red herrings by circling them in red pen.

Schema are _____ structures in the mind that help us to _____ sense of the world. We use schema to _____ our existing knowledge and help us to _____ events in our future. They are internal working models that develop ideas and _____ so that we can easily predict either what we should behave in certain situations.

For example, you may have a schema for a bank robbery which involves a man walking towards you wielding a gun shouting for everyone to get down and give him the money. However, if you witness a bank robbery where the man was wielding a knife, your schema would probably _____ this situation incorrectly as the man wielding a gun becomes the focus of your schema framework (it's what you _____ to see).

Schema develop with _____. As we experience new things we modify our schema and then use it in the _____ to help us when we find ourselves in a similar situation.

So, schema are chunks of knowledge which form expectations which then allow us to navigate our environment.

mental	physical	organise	survive	predict
understand	future	condense	learn	expectations
experience	manipulate	expect	interpret	past

Stretch and Challenge Task

How might schema be helpful to us?

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How might schema be a hindrance to us?

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Activity 8: Reconstructive Memory

Read the candidate responses to the exam question below. Using the marking criteria, award a mark out of 4. Try to identify exactly where each mark is awarded. You can use annotations in the space around the answer to do this.

Question:

Explain Bartlett's theory of reconstructive memory.

Marking Criteria:

Award 1 mark for every valid point which refers to reconstructive memory. Marks must be different and there is not repetition. The maximum marks that can be awarded is 4.

Candidate 1

Reconstructive memory is basically a set of building blocks. When we recall an event we take blocks from actual events that happened but there are gaps in the story. We fill these gaps with information that we get from our schema. These are our past experiences and expectations which help us to understand the world. So the story of what we remember it is partly real events and partly from our schema. This means that our reconstructive memories are not accurate.

Candidate 2

Every time we recall a memory we reconstruct it. We select information from what we have actually perceived and information from our schema (our knowledge and expectations) to build a memory. This is because we do not perceive everything and so there are gaps in our knowledge or we fill these gaps with what we think should go there. Schemas help us to reconstruct memories so that they make more sense to us.

Stretch and Challenge Task

Fill in the grid below to give more detailed feedback

Candidate	What was good?	What wasn't good?
1		
2		

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Activity 9: Individual Differences in Processing

Teacher Notes: Cut out the questions below and put them into a container. Allow students to draw a question like a lucky dip. They should then try to answer the question. If they are unable to answer it, they can pass it to another student who they think could answer it.



1. Miller suggested that the capacity of short-term memory is 7 ± 2 . Why has it been suggested that it is 7 ± 2 rather than just 7?
2. What is meant by processing speed? You cannot use the words speed or processing speed.
3. Describe an observable example where we can see differences in processing speed.
4. In which memory store does most of our processing occur?
5. What part of short-term memory is being used when we measure capacity using the digit span test?
6. How might capacity of short-term memory affect processing speed?
7. Why is the processing speed of young children slower than that of older children?
8. Why is the processing speed of the elderly slower than that of younger adults?
9. What is meant by digit span?
10. Using **only** your knowledge of processing speed, who would give the most reliable answers: a young child, an adult or an elderly person?

Stretch and Challenge Task

More-able students could be asked to elaborate on the answers given by the other students. They could also be asked to write their own questions that could be given to other more-able students.

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Activity 10: Individual Differences in

Working in groups, discuss one of the following questions which will be allocated. Choose one person to be the learning detective. This person is not allowed to contribute to discussion or take notes. They must simply listen. After three minutes the learning detective reports the content of the discussion back to the rest of the class. During this time the other group members make notes in the table below.

Question	Learning Detective Feedback
How do our personal experiences influence perception?	
Does everyone have the same schema?	
If three people witness an event, do they all remember it in the same way?	
What is the link between schema and episodic memories?	

Stretch and Challenge Task

A couple appeared on a talk show to try to resolve a dispute using a lie detector. The wife claimed that her husband was flirting with another woman while the man claimed he was just asking for a glass of water in the bathroom. Both were asked to take a lie detector. The results were quite surprising. Both were telling the truth. Using your knowledge of schema, how is it possible that they had completely different memories but both were telling the truth?

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Activity 11: Autobiographical Memory

Palombo et al (2012) used the Survey of Autobiographical Memory (SAM) to investigate differences in the following four types of autobiographical memory.

Task 1

Match the type of memory with the correct definition.

Episodic Memory

Semantic Memory

Spatial Memory

Prospective Memory

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Task 2

The main findings from the survey are listed below. Try to elaborate on each one to suggest about memory, why the differences might have occurred or how we could improve memory.

1. People scored either high or low on both episodic and semantic. We either had high or low overall.

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2. Men had better spatial memory than women.

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3. Depressives scored low on episodic and semantic memories.

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Stretch and Challenge Task

Write one detailed evaluative point for the Palombo study.

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Activity 12: Dyslexia and Children's

Read the statements below and identify if they are true or false. If you have identified a statement as false, you must rewrite the corrected version.

Statement	True or False?	Correction
For those with dyslexia, understanding and intelligence is not the problem.		
Those with dyslexia have difficulty with multitasking.		
It is believed that there are issues with the central executive in the working memory.		
Dyslexia is when someone has problems with moving and reading.		
In dyslexia there is difficulty with phonology (sounds).		
There is faster processing speed and issues with storage in the short-term memory.		
Language in those with dyslexia may be negatively affected.		
Dyslexia runs in families and so may be genetic.		
Short-term memory capacity increases as we get older so dyslexia interventions may be more beneficial the later dyslexia is identified.		
Help for dyslexia involves doing tasks which train the phonological part of working memory.		

Stretch and Challenge Task

Why might helping those with dyslexia also benefit society?

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Activity 13: Alzheimer's and Memory in C

Read the story of Raymond below and identify the symptoms of Alzheimer's that this by highlighting specific parts and drawing arrows into the margins to note the to identify any symptoms that are not Alzheimer's.

Raymond, a 74-year-old man, had had a headache and a sore throat for a few days and decided to walk to the chemist for his medicine. On his way back he realised he couldn't think of the address to get home. He looked around and became confused about where he had gone. He wandered for 40 minutes on what should have been a short minute walk before eventually finding his home.

Although this was distressing for Raymond he carried on with his life as normal and didn't tell his loved ones. He took his medicine as prescribed and started to feel better. The next morning Raymond's wife Edna was shocked to see that half of the bottle of medicine was gone. When she confronted Raymond about it he was unable to remember what medicine she was referring to.

That evening Raymond was watching the news and became angry. Edna changed the channel as she had done for years. Raymond had always been so easily aggravated by current affairs. He snatched the controller back from Edna and pressed buttons at the TV. He pressed button after button but was unable to find the correct channel. He became so frustrated he left the room.

Some time later Raymond was at a family party and was talking to a young man. On the way home Edna asked if he enjoyed his chat with his nephew Alex as he hadn't seen him for so long. Raymond couldn't recall the conversation and kept referring to one he'd had with Alex a few years earlier.

The issues became worse with time and Edna took Raymond to see a doctor. He had a brain scan, which showed a depletion of brain matter, and he was diagnosed with Alzheimer's disease.

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Activity 14: Brain Damage Studies

Cut out the dominoes and match the question with the correct answer.

Q. What is the problem with data from brain damage studies?	A. To relieve symptoms of epilepsy.
Q. Why is qualitative data not good?	A. Loss of memories from before injury.
Q. Why is qualitative data good?	A. Hippocampus
Q. What is the hippocampus responsible for?	A. An inability to form new memories.
Q. What is retrograde amnesia?	A. It is biased and not scientific.

Q. What was the problem from HM's surgery?	
Q. What research method was used in the HM study?	
Q. What type of data was collected from the HM study?	
Q. What is anterograde amnesia?	
Q. Why did HM have a surgical procedure?	

Stretch and Challenge Task

Write four of your own dominoes.

Q.	A.
Q.	A.

Q.	
Q.	

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Activity 15: Baddeley (1966)

Task 1

Look at the Baddeley study and complete the table below.

	Method	Potential
Research Method		
Design		
Method of Data Collection		

Task 2

Think of your own point of evaluation for the study (this does not have to be research method related)

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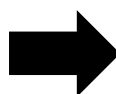
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Stretch and Challenge Task

Suggest ways you could improve the study based on the points you have raised.

Problem



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Activity 16: Schmolck et al (20

On the board there is a grid like the one below.

Method	R
Conclusion	Ev

Instructions:

- Each group has a different colour of Post-it note (or identify group name on t have different colours).
- In groups, write as many points about the study as you can on your Post-it n correct section on the board.
- You will have three minutes to do this.
- After three minutes the teacher will read out the points that have been made is a valid point.
- Each correct point is returned to the team who made it.
- Once all the points have been read out, the team with the most correct Post-

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Activity 17: Steyvers and Hemmer

On the board there is a grid like the one below.

Method	
Conclusion	

Instructions:

- Each group has a different colour of Post-it note (or identify group name on t have different colours).
- In groups, write as many points about the study as you can on your Post-it no correct section on the board.
- You will have three minutes to do this.
- After three minutes the teacher will read out the points that have been made is a valid point.
- Each correct point is returned to the team who made it.
- Once all the points have been read out, the team with the most correct Post-

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Activity 18: Sebastián and Hernández

On the board there is a grid like the one below.

Method	
Conclusion	

Instructions:

- Each group has a different colour of Post-it note (or identify group name on the board and have different colours).
- In groups, write as many points about the study as you can on your Post-it note and stick it in the correct section on the board.
- You will have three minutes to do this.
- After three minutes the teacher will read out the points that have been made and decide if it is a valid point.
- Each correct point is returned to the team who made it.
- Once all the points have been read out, the team with the most correct Post-it notes wins.

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Activity 19: Ethics in Cognitive Re

Write a consent form for the participants in the Baddeley (1966b) study. Include as many of the ethical guidelines listed below as you can. You can tick them off in the grid as you go.

Fully Informed Consent		Right to Withdraw
Debrief		Protection from Harm
Confidentiality		No Deception

[illegible]

Stretch and Challenge Task

Was the Baddeley study completely ethical?

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Activity 20: Practical Issues in the and Implementation of Research

Read the passage of text and identify any errors you may find using a highlighter. corrections in the space below.

Conducting research in cognitive psychology is problematic and it is not possible for a study to take place. Lots of research in this field uses the experimental method which is usually done in a laboratory setting. Using this method allows the researcher to be able to establish cause and effect. It also ensures the highest level of control over variables, which increases the validity of the results. When we can eliminate all other variables, we can be more certain that the results are due to the manipulations of the independent variable, known as internal validity.

However, if we want our internal validity to be high then we must sacrifice ecological validity. This is because, in order to have strict control over variables, the setting of the study will then lack mundane realism and ecological validity. For example, a memory study involves activities such as learning lists of words or numbers and not real-life situations, which clearly is not reflective of real life. This becomes a problem when the researcher wishes to generalise their findings to settings outside of the study. How do we know what behaviours would occur in other settings? It is not possible to know this without observing the participant's natural environment and using memory tasks which resemble those that they usually do in our daily lives.

Clearly, the problem for cognitive research is that we must balance the need for internal validity with the need for realism.

Corrections

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Stretch and Challenge Task

Think about how you would design a memory study in a real-life setting. Note your ideas below.

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Activity 21: Reductionism in Cognitive

Read the passage below and try to convert it into another format on a separate piece of paper. It can be a spider diagram, picture, graphs, lists, etc. Be as imaginative and as creative as you can.

Reductionism is when researchers attempt to study and understand human behaviour by breaking it down into its constituent parts. An example of this in cognitive psychology is the study of the different memory stores (long- and short-term memory). Baddeley and Hitch (1974) took reductionism even further and reduced the short-term memory into even smaller components: the executive, phonological loop, visuospatial sketchpad and episodic buffer.

One advantage of using this approach is that it is very scientific. Reducing complex phenomena into simpler terms allows researchers to isolate variables and to study them in a controlled way to establish cause and effect. Most cognitive research uses laboratory experiments. For example, memory in a very controlled way. For example, Baddeley and Hitch (1974) conducted a study which required participants to complete cognitive tasks simultaneously. When there were no demands on the same component of memory then participants were unaffected. When there were placed demands on separate components then participants were more stressed. This allows researchers to identify and isolate the smaller component parts of memory and study them individually.

A disadvantage of the reductionist approach is that it fails to acknowledge the complexity of human behaviour. By reducing memory down to simple models of input and output, the theories omit the potential influence of emotion on memory. There is research in psychology which suggests that emotion plays a big role in memory. A popular concept is flashbulb memory states that we have a kind of photographic memory for events that are of significant emotion. For example, most people can recall where they were and how they felt in vivid detail on the day of the 11th September attacks. The multi store model and the working memory model fail to include the influence of emotion. Research which aims to address this limitation of the reductionist approach adopts a holistic perspective.

Stretch and Challenge Task

Describe one additional example of reductionism in cognitive psychology. Explain why it is a disadvantage.

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Activity 22: Comparisons between of Memory

Task 1

List similarities and differences between the working memory model and the multi-store model.

Similarities	Differences
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Task 2

Which explanation do you think is the best? Explain why you think this.

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Stretch and Challenge Task

Can you suggest any ways in which the explanations of memory could be improved?

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Activity 23: Is Cognitive Research Scientific?

Divide the group into two teams. One team will argue that cognitive research is scientific and the other team will argue that it isn't.

Below is a set of questions which will assist the students in forming their arguments. Students are also encouraged to raise their own points in addition to the cues/questions.

They will have two minutes to prepare their points and then five minutes to debate.

Please note that the questions are about psychological research in general and not about cognitive research in other topic areas. Students should be instructed to apply these points to cognitive research. This would be to use examples of studies to illustrate the points they make.

Cues/Questions



Is psychological research truly objective?

Does the use of the hypothetico deductive method make experimental research scientific?

Can we ever create a representative sample?

Does it matter that experimental research lacks ecological validity?

Can we ever completely control for confounding and/or extraneous variables?

Does the consistent replication of studies and results always mean that the findings are reliable?

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Activity 24: Nature and Nurture in Cognition

Read the following passage of text and highlight the parts referring to nature in one colour and parts referring to nurture in another colour. Colour the boxes below to indicate which argument.



Nature



Nurture

Cognitive psychologists believe that we are all born with the ability to process information and to complete cognitive tasks. However, the way in which we think is much based on our experiences. For example, consider episodic memory. We are born with the ability to form this type of memory but the content of such memories depends on what events occur in our own lives. Another example is schema. Again, everyone has the ability to form schema but the content of these is determined by our own personal experiences.

The case of HM can also be used to illustrate this issue. HM suffered significant seizures and so had an operation involving the removal of his hippocampal lobes. This resulted in devastating memory impairment. He was unable to transfer information from his short-term memory into his long-term memory and, as such, could not form new memories. The cause of this was biological – the removal of the hippocampal structure which is significant in human memory. HM also suffered from epilepsy from 11 years prior to the operation. The most acute memory loss in the months leading up to the operation could have been due to the increasing frequency of seizures and the medication.

The difficulty in isolating the cause of the amnesia is the lack of a true experimental condition. As the effects of this operation were irreversible it was impossible to compare HM's memory was like before the operation. How do we know that the memory loss was due to the removal of the hippocampus and not something else, such as the effects of the surgery or education? Maybe he was always going to have issues with his memory but the operation just sped it up or exacerbated it.

Stretch and Challenge Task

What is meant by the interactionist approach and how does it apply to cognitive psychology?

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Activity 25: How Has Knowledge of Developed over Time?

Starting with the MSM in its original form and ending with the addition of the episodic memory system (EWM), complete a storyboard showing how the theories of memory have developed over time. You may include any evaluations, such as the MSM is too simplistic, as part of the storyboard.

1.	2.
3.	4.
5.	6.

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Activity 26: Memory Research and Social Control

Read the case below and identify the parts which demonstrate how cognitive research of human memory have been used for social control. Do this by highlighting sections and making notes in the space below.

David has been arrested on suspicion of burglary and police officers are questioning him in the hope to take him to court.

Public appeals for information were made and several witnesses came forward with vital information for the case. Each witness was interviewed by specially trained officers who used the cognitive interview technique to try to gain as much accurate information as possible from each witness.

The case went to court but it was ruled that three of the witnesses would not be allowed to testify. The first was a young girl of four years. She was deemed as unreliable due to her age. The second witness was a 36-year-old schizophrenic man who was prone to hallucinations. The final witness, a 23-year-old waitress, had spent quite a lot of time talking to the police about what he thought about the event and the judge believed this had affected her testimony.

Three eyewitnesses were permitted to testify as it was felt that their testimony was reliable. None of them had spoken to any other witnesses and none had any prior criminal coverage of the case.

One witness was able to testify via a video link. This is because the stress of appearing in court would have been too high and she was considered quite vulnerable.

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Stretch and Challenge Task

Outline the benefits and drawbacks of social control.

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Activity 27: How Can We Use Knowledge of Memory in Real Life?

It is very important to remember why psychological research is done. The knowledge gained from psychological studies provides us with the ability to make life easier and/or better for those in need. The knowledge we have gained about the causes of psychological illness has helped in the development of treatments for those who suffer from them. Memory research has helped in many ways. Think of one practical application (use) of the theories of memory in the table below.

Theory	Application 1	How has this helped?
Multi Store Model		
Working Memory Model		
Reconstructive Memory		

Stretch and Challenge Task

Try to suggest how the application of cognitive research to real life may cause problems. You can discuss this generically, or use the applications above or another application.

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Activity 28: Socially Sensitive Research

Lots of cognitive research has focused on studying those with memory impairment with brain damage who have developed amnesia or those with dementia. HM was 51 years and is cited in around 12,000 journal articles having taken part in numerous tests. The important question is whether it is OK to do this. Conduct a cost-benefit type of research, noting your ideas in the table below.

Costs – The negative impact on the participant, their families and society

Benefits – The positive outcome for psychological knowledge and society

Costs	

Based on the points you have made, do you think it is appropriate to conduct research on memory impairment? Explain your answer.

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Stretch and Challenge Task

Explain why fully informed consent is a major ethical concern with this type of research. How do researchers deal with this issue?

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Activity 29: Quiz Card Revision

Cut out the two cards below and glue them back to back. Write one question for each category and the answers on the back.

The codes are as follows:

WM – Working Memory

MS – Multi Store Memory

RM – Reconstructive Memory

IDD – Individual Differences and Development

ST – Studies

ID – Issues and Debates

WM

MSD

RM

IDDD

ST

ID

Answers

WM

MSD

RM

IDDD

ST

ID

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Activity 30: Class Quiz

Divide the class into six teams and allocate each one of the following topics.

Working Memory

Multi Store Memory

Reconstructive Memory

Individual Differences and Dev

Studies

Issues and Debates

Each team has two or three minutes to devise five questions about their topic. The answer. A spokesperson from each team should read out the questions for the rest of the class. Teams could answer by writing the responses down or, to make it even more competitive, they could have a distinctive sound (each team will have a different sound).

Scores could be recorded on a table like the one below. This could be drawn onto a PowerPoint.

Team Name Topic				
Working Memory				
Multi Store Memory				
Reconstructive Memory				
Individual Differences and Developmental				
Studies				
Issues and Debates				

If there are not enough students in the class to make six teams then topics could be allocated to fewer teams.

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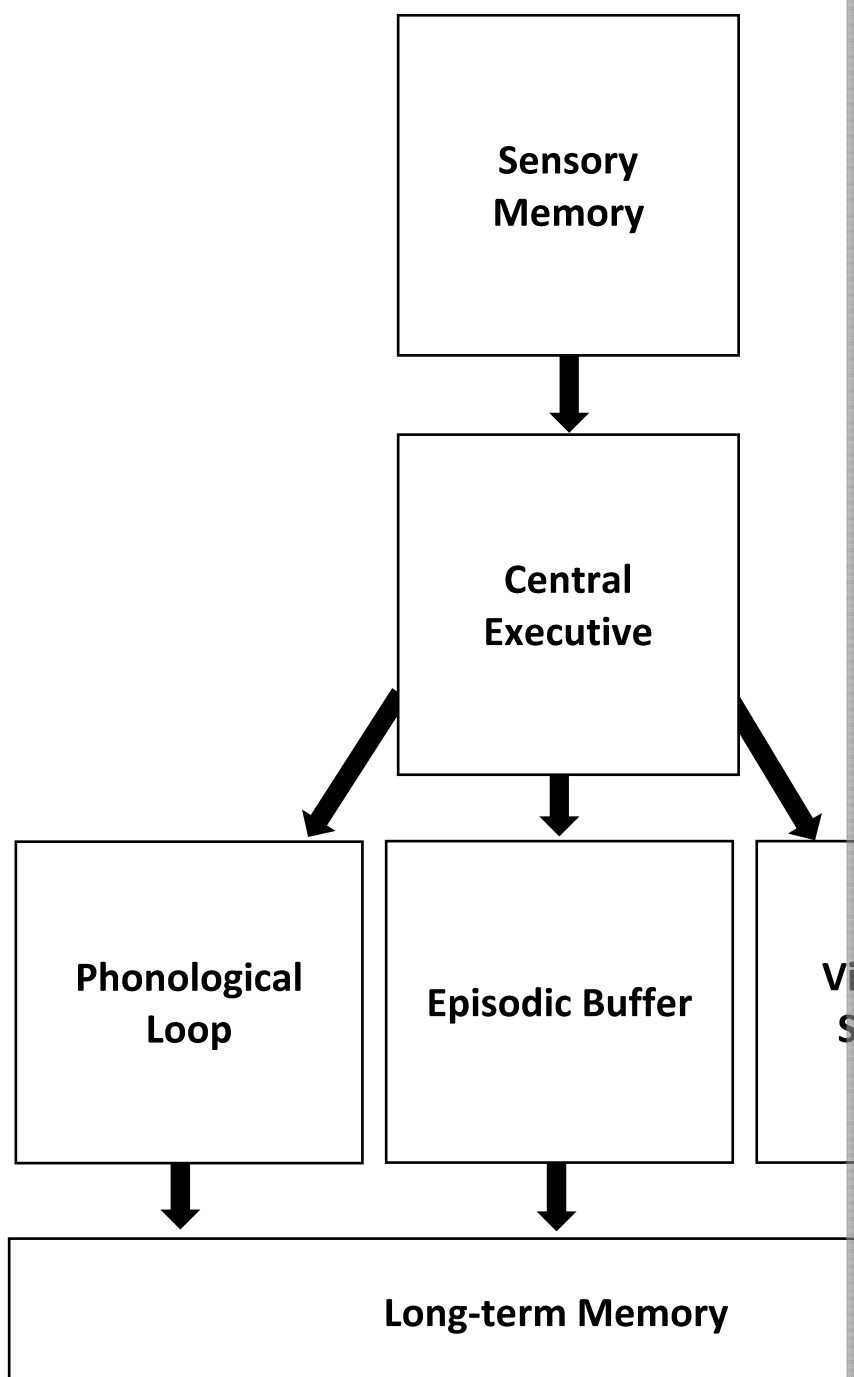
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Answers

Activity 1: Working Memory Model

Task 3:



Stretch and Challenge Task:

- | | |
|--|-----------------|
| a) Represents the inner voice (articulatory process) | PL |
| b) Has a limited capacity | PL, VSS, CE, EB |
| c) Key component of the working memory | CE |
| d) Integrates information from all other stores | EB |
| e) Represents the inner eye | VSS |
| f) Decides where data should be sent | CE |
| g) Deals with auditory information | PL |
| h) Used for planning spatial tasks | VSS |
| i) Deals with visual information | VSS |
| j) Data from the sensory memory arrives here first | CE |
| k) Represents the inner ear (phonological store) | PL |
| l) Can temporarily store visual and acoustic information | EB |

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Activity 2: Working Memory Model Evidence

Photo 1:

Evidence for the WMM comes from patients with brain damage. Damage to specific areas of the brain can affect the function of certain aspects of memory. For example, damage to the area containing the visuo-spatial sketchpad (VSS) means that the patient's ability to perform spatial tasks is impaired.

Stretch and Challenge: Evaluation

We do not know what the cognitive abilities of brain-damaged patients were before the damage. Therefore, we cannot reliably or scientifically measure the effects of brain damage on cognitive performance compared to a control condition.

Photo 2:

Dual task studies demonstrate people's ability to do two cognitive tasks simultaneously as long as they use separate stores (e.g. the PL and the VSS). If the two tasks require the use of one store then performance is impaired. This is because each store in the WMM has a limited capacity.

Stretch and Challenge: Evaluation

This kind of research lacks ecological validity due to it being conducted in artificial laboratory conditions. It may not accurately reflect real life and, as such, we are unable to generalise the findings to a real-world context.

Photo 3:

Brain scans provide evidence for the separate systems in the short-term memory. When participants perform different tasks, the corresponding part of the brain lights up on the brain scan. For example, if a participant is performing a verbal task, the language area of the brain will show activity. When performing a visual task, the visual area of the brain will show activity. This supports the idea that verbal and visual information is dealt with in different parts of the brain and so supports the working memory model.

Stretch and Challenge: Evaluation

Although this kind of research is highly controlled it is difficult for researchers to completely control for confounding variables. For example, how can they prevent participants from employing their own cognitive strategies? It is possible that a maths task may be given and that one person processes it in a verbal way (by counting on their fingers) while another person may do it visually (by visualising counters or blocks). This would mean that different parts of the brain light up when doing the same task.

Activity 3: Sensory, Short-term and Long-term Memory

a) The type of memory being referred to is: short-term memory

Stretch and Challenge Task:

Lucy is using the process of maintenance rehearsal. This is a strategy we use to maintain information in short-term memory to prevent forgetting.

b) The type of memory being referred to is: sensory memory

Stretch and Challenge Task:

Benny is thinking about the duration of sensory memory. Information in this store lasts for a very short time. For visual continuity, which is when we see everything moving smoothly. Imagine a flick book. If you flick through the pages too quickly, for one second then it wouldn't look as if it was moving. Look at each picture for a fraction of a second, then flick through them really quickly and all of a sudden it looks like a moving image. It is the same for our sensory memory.

c) The type of memory being referred to is: long-term and short-term memory

Stretch and Challenge Task:

Carly is actually using two memory stores. Describe why this is the case.

Carly is using long-term memory because she has retrieved a memory from her past. Since she has retrieved it, it is now in her short-term memory as STM represents the psychological present. She has brought information from LTM and brought it into STM to think about it.

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Activity 4: Information Processing

Task 1 and Task 2:

Memory Store	Description	Storage Capacity	Storage Duration	
Sensory Memory	c g	Very limited	Fractions of a second	No
Short-term Memory	a e f	7 +/- 2	18 seconds	V
Long-term Memory	b d	Potentially limitless	Up to a lifetime	E

Task 3:

Information may be stored in separate fragments and so when retrieving we need to access parts of it to get the full memory trace. When we can only access one part of it we have known as the 'tip of the tongue' phenomenon.

Information may be rehearsed to keep it for long enough so that we can quickly scan it and retrieve it (retrieval). Old or weak memory traces are displaced by new information and so are forgotten.

Activity 5: Multi Store Model Evidence

- a) The quality of recall for words at the end of the list is different. In the immediate recall condition, it is good. In the recall after distraction condition, it is poor.
- b) In the immediate recall condition, the words at the start of the list are safe in the short-term memory long enough to be processed (primacy effect). The words at the end are still in the short-term memory. The middle words have been displaced from short-term memory and are forgotten. The words at the end have been processed into long-term memory.

In the recall after distraction condition, the words at the start of the list are safe in the short-term memory long enough to be processed (primacy effect). The middle words have been displaced from short-term memory and are forgotten. The last words and are forgotten. The words at the end have also been displaced from short-term memory by the distraction task. The distraction task occupies short-term memory and so recall for the last words is poor.

- c) This provides evidence to support the multi store model as it shows that short- and long-term memory are separate systems.

Stretch and Challenge Task:

The multi store model is reductionist as it condenses the complexities of human memory into a simple model. It assumes that the short-term memory is a passive system through which information flows in a simplistic way. Later research has discovered that the short-term memory actually consists of three subsidiary systems, each with their own capacity and durations. This may bring into question the validity of the multi store model. The capacity of short-term memory is 7 +/- 2 items. This means that short-term memory is far more active than the multi store model suggests.

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Activity 6: Types of Long-term Memory

Episodic Memory

Episodic memory is memory for personal events or episodes in our lives. This is not shared memory as not everyone who experienced an event can have a memory of it.

Example: Any personal event, e.g. a favourite birthday, last Christmas, receiving exam grades.

Semantic Memory

This is memory for specific facts and information. It is our knowledge store where we can store facts and things as if we had a mental encyclopaedia. Semantic memory may be referred to as shared memory as everyone has access to the knowledge of what the capital city of the USA is.

Example: Any knowledge that is accessible to everyone such as mathematical rules (square root of 2), facts about Harry Potter and other general knowledge.

Stretch and Challenge Task:

Episodic memories are of personal experiences that we have in our lives. Being a witness to a crime is a type of memory. Since episodic memories are more prone to distortion by various influences, it is possible that they may not be the most reliable of memories. It is possible for a witness's episodic memory to be distorted and manipulated. This means that the testimony of an eyewitness cannot be taken as solely reliable.

Activity 7: Schema Theory

Schema are **MENTAL** structures in the mind that help us to **UNDERSTAND** and make sense of the world. They help us to **ORGANISE** our existing knowledge and as templates to help us to **PREDICT** events in the future. They are working models which allow us to develop ideas and **EXPECTATIONS** so that we can easily understand what happens or how we should behave in certain situations.

For example, you may have a schema for a bank robbery which involves a man wearing a mask, shouting for everyone to get down and give him the money. However, if you were in a room and a man was wielding a knife, your schema would probably make you **INTERPRET** this situation as a robbery because wielding a gun because that's what fits with your schema framework (it's what you **EXPECT**).

Schema develop with **EXPERIENCE**. As we experience new things we store the information in our memory to help us when we find ourselves in the same or a similar situation.

So, schema are chunks of knowledge which form expectations which then allow us to make sense of the world.

mental	physical	organise	survive
understand	future	condense	learn
experience	manipulate	expect	interpret
predict	expectations	past	behave

Red here

Stretch and Challenge Task:

- Schema help us to choose the correct or appropriate behaviour for the situation we are in. They help us to make sense of what is going on around us so that we can function in the best way possible.
- Because we use schema to help interpret the world, we might sometimes perceive things differently than they are. In normal day-to-day life this isn't an issue, but when we think about the quality of our memories it becomes clear that schema may taint the quality of our memories.

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Activity 8: Reconstructive Memory

Candidate 1:

The question does

Reconstructive memory is basically a set of building blocks. When the event we take blocks from actual events that happened but there the gaps with information that we get from our schema (1). These are experiences and expectations which help us to understand the world. the story of what we remember it is partly real events and partly from our schema. This means that our reconstructive memories are

Repetition – this has already been said, just in a different way.

Candidate 2:

Every time we recall a memory we reconstruct it (1). We select from what we have actually perceived and information from (prior knowledge and expectations) to build a memory (1). This we can't perceive everything and so there are gaps in our knowledge understanding so we fill these gaps with what we think should be. Schemas change our memories so that they make more sense

Stretch and Challenge Task:

Candidate	What was good?	What wasn't good?
1	Good understanding of what reconstructive memories are.	Points were repeated, thus not adding any creditworthy material. Definition of schema does not answer the question and so is not creditworthy.
2	Every sentence has different information and is creditworthy.	

Activity 9: Individual Differences in Processing Speed

- To account for individual differences in capacity.
- How quickly we can think about, sort out and manage information in our memory system.
- One person may take longer to read a passage of text than another.
- Short-term memory
- Phonological Loop
- The smaller the capacity, the slower the processing speed.
- Younger children have a smaller digit span (short-term memory capacity) and so can't hold as many digits as older children and adults, who have larger digit spans.
- Ageing can affect digit span; it decreases in older age, meaning that processing speed decreases.
- The number of digits we can hold in our short-term memory at one time (capacity).
- The adult, because they have a larger digit span and hence a faster processing speed.

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Activity 10: Individual Differences in Schema

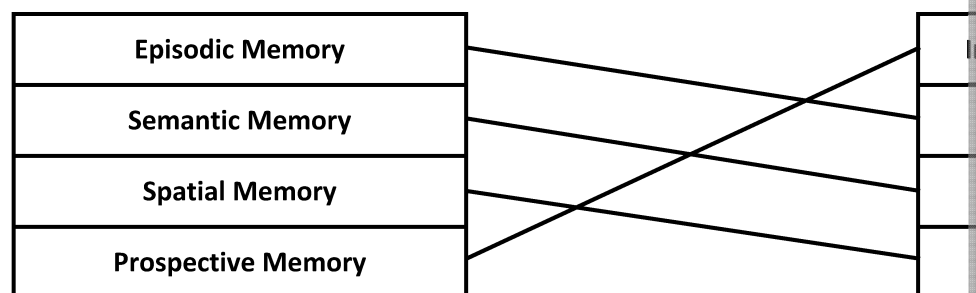
Question	Learning Detective Feedback
How do our personal experiences influence perception?	Our personal experiences allow us to build internal models (schemas). These are personal to us as they depend on our own experiences, not those of others. These schemas are constantly updated as we perceive via our senses is supplemented with our personal schemas, making the world easier and more efficient.
Does everyone have the same schema?	Everyone's schemas are different. This is because schemas are based on experiences. They can be similar to another person's but will be different.
If three people witness an event, do they all remember it in the same way?	As we all have different schemas which affect our perception, they may witness an event differently from one another. We all make use of our existing knowledge. We reconstruct memories again and again using information using our schemas. These subtle changes become more pronounced over time. Therefore, does this then ultimately everyone's memory will be slightly different.
What is the link between schema and episodic memories?	Schemas are created based on our experiences. Our experiences, therefore, constitute episodic (autobiographical) memory.

Stretch and Challenge Task:

Our expectations and schemas determine how we perceive things. If the woman had had previous experiences, she will have schemas which result in the expectation that relationships are bad and she will feel that what she has actually seen to fit her schema. Consequently she is telling the truth according to her schema, but it is not actually what happened.

Activity 11: Autobiographical Memory

Task 1:



Task 2:

1. This shows that there are significant individual differences in memory. Teachers could use this to design activities that take into account the differences between the students in their classes. By acknowledging that people have different memories, a teacher can design activities so that all students can access the information.
2. This suggests a biological cause for this difference. It may be that it arises from evolutionary differences. For example, gatherers and, therefore, required good geographical and spatial knowledge, whereas hunters, where location and places were less of a concern. This may have resulted in significant differences in spatial memory.
3. This may be due to the possibility that depressed individuals have very negative thoughts. This could result in less attention being paid to events happening around them, resulting in fewer memories. This lack of attention may also apply to facts and information being presented, meaning this is not being encoded into memory.

Stretch and Challenge Task:

The Palombo study may be subject to social desirability. This is because a self-report method (Autobiographical Memory) was used to gather data. This means that participants could lie or manipulate their responses to what they think the researcher wants to hear, what they think the 'correct' answer is or the answer they think is socially acceptable. This clearly affects the validity of the data in that the responses may not be true.

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Activity 12: Dyslexia and Children's Memory

Statement	True or False?	
For those with dyslexia, understanding and intelligence is not the problem.	T	
Those with dyslexia have difficulty with multitasking.	T	
It is believed that there are issues with the central executive in the working memory.	F	It is believed that there are issues with the phonological loop in the working memory.
Dyslexia is when someone has problems with moving and reading.	F	Dyslexia is when someone has problems with spelling and reading.
In dyslexia there is difficulty with phonology (sounds).	T	
There is faster processing speed and issues with storage in the short-term memory.	F	There is slow processing speed and issues with storage in the short-term memory.
Language in those with dyslexia may be negatively affected.	T	
Dyslexia runs in families and so may be genetic.	T	
Short-term memory capacity increases as we get older so dyslexia interventions may be more beneficial the later it is identified.	F	Short-term memory capacity decreases as we get older so dyslexia interventions may be more beneficial the earlier it is identified.
Help for dyslexia involves doing tasks which train the phonological part of working memory.	T	

Stretch and Challenge Task:

If we help those with dyslexia to increase academic attainment then this will result in a better educated population. This will help to increase the economy of the country as these individuals will be able to contribute to society as part of the workforce.

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Activity 13: Alzheimer's and Memory in Older People

Key:

Bold = A symptom of Alzheimer's

Italics = Not a symptom of Alzheimer's

The onset of Alzheimer's is usually in older age.

Raymond, a **74-year-old** man, had had a *headache and a* for a few days and decided to walk to the chemist to get . On his way back he realised he couldn't think how to get . He looked around and became **confused** about where he was. He wandered for 40 minutes on what should have been a 10 minute walk before eventually finding his home.

Forgetfulness for recent events.

Although this was distressing for Raymond he carried on as normal and didn't tell his loved ones. He took his medicine and started to feel better. The next morning Raymond's wife was shocked to see that half of the bottle of medicine was gone. When she confronted Raymond about it he was **unable to remember what medicine she was referring to.**

Although mood swings and aggression may occur in Alzheimer's, this is not unusual for Raymond.

That evening Raymond was watching the news and became **angry**. Edna changed the channel as she had done for years. Raymond had always been so easily aggravated by current affairs. Raymond snatched the controller back from Edna and pressed at the TV. **He pressed button after button but was unable to find the correct channel.** He became so frustrated he left the room.

Some time later Raymond was at a family party and was talking to a young man. On the way home Edna asked if he enjoyed his chat with his nephew Alex as he hadn't seen him for so long. **Raymond couldn't recall the conversation and kept repeating the same one he'd had with Alex a few years earlier.**

Alzheimer's is developmental and gets worse over time.

The issues became worse with time and Edna took Raymond to see a doctor. He had a brain scan, which showed a **depression in the brain matter**, and he was diagnosed with Alzheimer's disease.

Atrophy of brain matter occurs in Alzheimer's.

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Activity 14: Brain Damage Studies

1. To relieve symptoms of epilepsy.
2. Hippocampus
3. Learning, emotion and memory.
4. Loss of memories from before injury.
5. An inability to form new memories.
6. Case study
7. Qualitative
8. It is biased and not scientific.
9. It is more in depth and detailed.
10. There is no reliable control condition to compare data to.

Activity 15: Baddeley (1966b)

Task 1:

	Method	Potential weaknesses
Research Method	Laboratory experiment	<ul style="list-style-type: none"> • Low ecological validity • High demand characteristics • High researcher effect
Design	Independent groups	<ul style="list-style-type: none"> • Individual differences • Researcher bias
Independent Variable	The type of word (acoustically similar or dissimilar and semantically similar or dissimilar)	<ul style="list-style-type: none"> • Word length must be controlled • Some words may have multiple meanings

Task 2:

This study has very good internal validity as it is a laboratory experiment. This means that extraneous variables, meaning that any changes in the dependent variable are more likely due to the independent variable (type of word).

Stretch and Challenge Task:

Problem	Resolution
Low ecological validity	Design a task which more accurately reflects real life. The study could also be conducted in a more naturalistic setting which would increase extraneous variables and reduce internal validity.
Individual differences	The researcher could use the process of random allocation to allocate participants to conditions. This would minimise the chance of having individual differences affecting the results.

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Activity 16: Schmolck et al. (2002)

Method <ul style="list-style-type: none"> • Six participants with amnesia compared to eight participants without amnesia. • The participants with amnesia either had damage to the hippocampus or the medial temporal lobe and anterolateral temporal cortex (MTL+). • HM had damage to the hippocampus and medial temporal lobe (not the anterolateral temporal cortex). • Participants completed nine tests examining semantic memory. • Participants were asked to define, sort or identify a series of line drawings. 	Results <ul style="list-style-type: none"> • Patients with damage as well as those in the control group performed well on the tasks. • Patients with MTL+ performed poorly on the tasks. • HM did not perform well on the tasks. • The degree of damage to the hippocampus affected performance (the greater the damage, the poorer the performance).
Conclusion <ul style="list-style-type: none"> • The hippocampus is not responsible for semantic memory because those with damage to this area performed as well as the control group on the tasks. • The anterolateral cortex is responsible for semantic memory because HM did not perform as badly as those with MTL+. 	Evaluation <ul style="list-style-type: none"> • Low population validity and poor generalisability. • Evidence from brain scans is correlational. • It's difficult to know the abilities of those with brain damage as they may have developed new connections to compensate for the damage or the brains of the individuals may be different, which could affect results. • The tests to assess semantic memory are not very realistic and ecological.

Activity 17: Steyvers and Hemmer (2012)

Method <ul style="list-style-type: none"> • In the prior knowledge control group, there were 22 participants who were asked to list what objects they would expect to see in five different scenes. • In the perception control group, there were 25 participants who were asked to look at 25 photos of the five scenes (five of each) and to list as many objects they could see. • In the experimental condition, there were 49 participants who were asked to recall objects they saw in each of five scenes. • Each photo was presented for either 10 seconds or 2 seconds to differentiate the effects of semantic and episodic memory. 	Results <ul style="list-style-type: none"> • In the perception control group, objects were named more frequently in the town scene than in the office scene. • In the prior knowledge control group, objects were likely to be in the town scene than in the office scene. • The findings from the experimental condition show that people have strong prior knowledge of particular scenes, which affects their recall. • In the experimental condition, objects were recalled after 10-second exposure more frequently than after two-second exposure. • In the experimental condition, objects were recalled for low probability objects more frequently than for high probability objects.
Conclusion <ul style="list-style-type: none"> • When a scene is artificial in nature and has been manipulated in order to trick a participant, there is a higher error rate for high probability objects. • Episodic memory and semantic memory work together in real-life settings to give recall with fewer errors. 	Evaluation <ul style="list-style-type: none"> • Looking at photos of scenes is not representative of real life and, therefore, results may not be generalisable. • There may be demand characteristics as participants try hard to recall objects accurately. • It was a laboratory experiment, so results may not be realistic.

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Activity 18: Sebastián and Hernández-Gill (2012)

Method <ul style="list-style-type: none"> • 570 participants were arranged into five age groups (5 years, 6–8 years, 9–11 years, 12–14 years, 15–17 years). • Digit span was tested by presenting digit strings to participants and asking them to recall them in the correct order. • Digit strings got longer on each presentation. • The results were compared to previous research using elderly participants and patients with dementia (Alzheimer's and fronto-temporal dementia). 	Results <ul style="list-style-type: none"> • Digit span increased from age 5 to 5.83 at age 7. • The development of digit span is similar to the development of verbal ability. • Development seems to plateau around age 7. • Elderly patients had a digit span similar to 7-year-olds and their children. • Those with Alzheimer's disease had a digit span similar to six-year-olds. • Those with fronto-temporal dementia had a digit span similar to the young group. • There was no significant difference between elderly patients and young people. • Spanish digit span is shorter than Anglo-Saxon digit span from age 7. This is due to sub-vocalisation.
Conclusion <ul style="list-style-type: none"> • Digit span increases with age. • Development of digit span occurs at around age 7 when children can sub-vocalise. • Spanish digit span is shorter than Anglo-Saxon digit span from age 7 due to sub-vocalisation (Spanish numbers have more syllables than Anglo-Saxon numbers). • Digit span declines with older age. • Dementia does not significantly affect digit span. 	Evaluation <ul style="list-style-type: none"> • Data are reliable as they are based on many studies using the same method. • High level of control in the experiment (high internal validity). • Recalling digit strings is a skill used in normal everyday life. • It was conducted in a natural setting.

Activity 19: Ethics in Cognitive Research

Thank you for agreeing to take part in this research. This is a study investigating how information is stored in short-term memory store. You will be asked to look at a list of words and then be asked to recall as many words as you can. You will be asked to do this over four trials using the same list of words each time.

You will in no way be under any stress or in any danger during this experiment, but if at any time you feel uncomfortable, or do not wish to continue for any other reason, you are free to leave. Even if you have agreed to take part, you have the right to withdraw your results if you no longer wish your data to contribute to the research.

The information you provide will be kept in the strictest confidence and will not be shared with anyone outside the research.

On your completion of the experiment you will be offered a debrief session where all elements of the study will be explained to you. This will also be your opportunity to ask any questions you may have regarding the research.

Please could you sign below to show that you consent to taking part in this study.

Sign:

Print Name:

Date:

Stretch and Challenge Task:

This study was not completely ethical as deception was used. This consequently means that the participants did not give informed consent. They were deceived about the fifth and final trial and were led to believe that the study was over.

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Activity 20: Practical Issues in the Design and Implementation of Research

Conducting research in cognitive psychology is problematic and it is not possible for the of research in this field uses the experimental method and is usually done in a **natural** setting. The researcher to isolate variables in order to establish **result** and effect. It also ensures that **dependent** variables which increases the validity of the results. When we can eliminate **uncertain** that the results are due to the manipulations of the independent variable. This

However, if we want our internal validity to be high then we must sacrifice the **population** order to have strict control over variables the setting becomes very **realistic**. The study validity and **population** validity. For example most research into memory involves activities such as numbers and watching videos of car accidents which clearly is not reflective of real life. The researcher wishes to generalise their findings to settings outside of the study. How do we know what behaviours would occur in other settings? It is not possible to know this without doing research in a natural environment and using **biological** tasks which resemble those that we would use in

Clearly, the problem for cognitive research is that we must balance the need for control

Corrections

1. Laboratory
2. Cause
3. Extraneous
4. Certain
5. Ecological
6. Artificial
7. Ecological
8. Memory/Cognitive

Stretch and Challenge Task:

Any ideas which involve studying participants in a natural environment and using tasks which

For example: Participants were shown a list of items on a shopping list. This was then removed and they had to go and buy the items from a supermarket. The number of correct items was recorded.

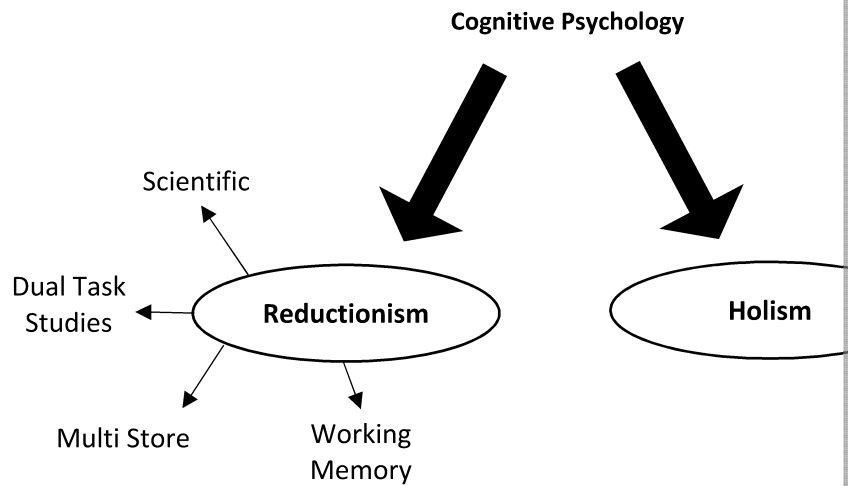
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Activity 21: Reductionism in Cognitive Research

Students should be allowed to create notes in a form of their choosing. An example is shown below.



Stretch and Challenge Task:

Another example of reductionism in cognitive psychology is the case of HM. After an operation to alleviate the symptoms of epilepsy, he suffered severe memory impairment. It was believed the hippocampus was very important in memory. Researchers conducted lots of experiments to establish what role the hippocampus had in memory. They would isolate variables to establish causation. Schmolck et al (2002) were able to demonstrate that the anterolateral cortex, and not the hippocampus, was important for semantic memory.

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Activity 22: Comparisons between Theories of Memory

Task 1:

Similarities	
<ul style="list-style-type: none"> Both models agree that the information flows from sensory, through STM in to LTM. They both state that information flows backward from LTM to STM during retrieval. They agree that STM has limited capacity and duration. They both state that STM encodes acoustically and visually and that LTM encodes semantically. Both use the computer metaphor to illustrate how memory works. 	<ul style="list-style-type: none"> WM suggests that STM says. WM consists of the central loop, visuospatial sketchpad, and the phonological loop. MSM states that the central loop suggests this could just be a part of the whole of STM. WM shows that the STM is processing of information. WM shows how cognitive

Task 2:

Although the multi store model provided a good explanation in its time, it has since been replaced by the working memory model. The working memory model has provided the basis for further investigation and has enabled knowledge and research to be built upon. The working memory model is a much more comprehensive explanation of memory as it accounts for the processes of encoding, storage, and retrieval, and the multifaceted parts of short-term memory. It is not, however, without its limitations, and even further.

Stretch and Challenge Task:

These explanations do not fully explain human memory. They do not account for the influence of emotions, motivation, and social factors on how we perceive, encode and remember things. Reconstructive memory and the theory of schemas are ideas which do explain these phenomena. In this way it can be seen that no one theory could try to combine these explanations to give a fuller picture of how memory works.

Activity 23: Is Cognitive Research Scientific?

Cues/Questions	Psychology IS a Science	Psychology IS NOT a Science
Is psychological research truly objective?	<i>The experimental method allows for the control of variables and for scientific observations of behaviour. Statistical methods of data analysis eliminate subjectivity from interpreting such observations.</i>	<i>Humans are not objective. They are influenced by their own biases and emotions. They are not truly objective. They are not truly objective. They are not truly objective.</i>
Does the use of the hypothetico deductive method make experimental research scientific?	<i>The development and testing of hypotheses is extremely scientific. Using the falsification method allows hypotheses to be tested in the most rigorous ways. The longer a hypothesis remains intact, the stronger the theory that emerges from it.</i>	<i>This method is not scientific. It is not scientific. It is not scientific. It is not scientific. It is not scientific.</i>
Can we ever create a representative sample?	<i>The varying sampling methods give varying degrees of representativeness. Stratified sampling provides the most representative samples, which mirror the proportions of the different types of people in society.</i>	<i>No sample is truly representative. There will always be some bias. There will always be some bias. There will always be some bias.</i>
Does it matter that experimental research lacks ecological validity?	<i>To be truly scientific, extraneous variables should be eliminated as far as is possible. Research must, therefore, be conducted in lab settings. This ensures a high degree of internal validity and researchers can be confident about cause and effect.</i>	<i>Any research conducted in a lab cannot be truly scientific. It is not scientific. It is not scientific. It is not scientific. It is not scientific.</i>
Can we ever completely control for confounding and/or extraneous variables?	<i>Research is highly controlled and extraneous variables are eliminated as much as possible. Pilot studies allow researchers to identify possible extraneous variables and to modify in light of this.</i>	<i>We can never completely control for confounding and/or extraneous variables. We can never completely control for confounding and/or extraneous variables. We can never completely control for confounding and/or extraneous variables.</i>
Does the consistent replication of studies and results always mean that the findings are true?	<i>The more that research is replicated and the same conclusions reached, the stronger the theory becomes. This improves the reliability of the results.</i>	<i>Consistent replication does not always mean that the findings are true. Consistent replication does not always mean that the findings are true. Consistent replication does not always mean that the findings are true.</i>

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Activity 24: Nature and Nurture in Cognitive Research

Nature = **Bold**

Nurture = *Italics*

Cognitive psychologists believe that we are all **born** with the ability to process a complete cognitive tasks. However, the way in which this develops is very much *For example, consider episodic memories. **Everyone has the ability to form this** content of such memories depends very much on *events that occur in our own* schema. Again, **everyone has and uses schema** but the content of these is *determined by life experiences.**

The case of HM can also be used to illustrate this issue. HM suffered significantly so had an operation involving the **removal of his hippocampus** from both temporal lobes, resulting in a devastating memory impairment. He was unable to transfer information from his short-term memory to his long-term memory and, as such, could not form new memories. **The cause of his memory impairment was the removal of the hippocampus.** This is clearly a structure which is significant in memory. HM suffered from retrograde amnesia for up to 11 years prior to the operation. The most recent years leading up to the operation could have been due to the **seizures and epilepsy medication.**

The difficulty in isolating the cause of the amnesia is the lack of a true experimental control. As the effects of this operation were irreversible it was impossible to know exactly what his memory was like before the operation. How do we know that the problems he faced were due to the **hippocampus** and not something else, such as the *quality of his education*? Maybe he has issues with his memory due to his *life experiences* but the operation just sped up the process.

Stretch and Challenge Task:

This approach states that human behaviour – in this case, memory – is not a result of either nature or nurture, but, in fact, a combination of the two. We may be born with the ability to use our memory, but our life experiences will shape the way in which this develops. This means that we are a result of both nature and nurture.

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Activity 25: How Has Knowledge of Memory Developed over Time?

<p>1.</p>	<p>2.</p> <p>1 + 1</p> <p>Too</p>
<p>3.</p> <p>STM</p>	<p>4.</p> <p>Shows h</p> <p>in STM</p>
<p>5.</p> <p>STM</p>	<p>6.</p> <p>What about</p> <p>types of</p>

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Activity 26: Memory Research and Social Control

David has been arrested on suspicion of burglary and police officers are building a case against him to court.

Public appeals for information were made and several witnesses came forward claiming to know what happened in the case. Each witness was **interviewed by specially trained officers**. They used the **cognitive interview** to gain as much accurate information as possible from each witness.

The case went to court but it was ruled that **three of the witnesses would be unable to testify** for the first four years. She was deemed as unreliable due to her age. The second witness was a 36-year-old man who was prone to hallucinations and delusions. The final witness, a 23-year-old waitress, had been asked by the second witness about what he thought about the event and the judge believed that her testimony was unreliable.

Three eyewitnesses were permitted to testify as it was felt that their testimonies were reliable. They had spoken to any other witnesses and none had watched any media coverage of the case.

One witness was **able to testify via a video link**. This is because the stress of being in the witness box was high and she was considered quite vulnerable.

The use of the specially trained officers and the cognitive interview are aimed at gaining accurate information from the witness. The quality of information, and indeed the interview itself (there are strict rules to follow when conducting interviews), would determine whether it could be used for trial.

The decision to omit three of the eyewitness accounts has been made due to the perceived unreliability. They have been labelled as unreliable due to various factors. In this way the trial is being controlled.

This same point applies to the three witnesses who have been able to testify. They were deemed reliable and so their testimonies were allowed to be heard. One is even allowed to do this via video link. This shows how strictly trials may be controlled.

Stretch and Challenge Task:

It is very important that court cases are controlled based on our knowledge of memory. This helps to prevent a miscarriage of justice and allows the defendant and victim a fair trial. However, the omission of some evidence is problematic in that they may have vital information which may actually be true.

Activity 27: How Can We Use Knowledge of Memory in Real Life?

Theory	Application 1	How has this application improved society?
Multi Store Model	<ul style="list-style-type: none"> Revision (rehearsal) Number plates and phone numbers (capacity of 7 ± 2) 	<ul style="list-style-type: none"> Students can be taught effective revision techniques to improve exam results. This will provide a better educated society and help to improve the economy. Police can apprehend offenders more effectively as the number of number plates is possible.
Working Memory Model	Helping those with dyslexia	As dyslexia may be due to problems with the working memory system, that focus on developing skills using this system can help. Increasing vocabulary and spelling skills in some ways this can be done.
Reconstructive Memory	Eyewitness testimony	Understanding the reconstructive nature of memory allows interview strategies to be used in eyewitness testimony to reduce the drop in false convictions based solely on memory.

Stretch and Challenge Task:

Using research to help improve society is undeniably effective and an excellent use of the psychological research. Otherwise, what would be the point in psychology? However, as we change the more studies we do. Sometimes we can even show previous ideas to be incorrect from research which may later be shown to be incorrect, then what might the impacts of the operation on HM, which was intended to alleviate the symptoms of epilepsy, actually have on memory. This did allow our knowledge to progress, but the impact upon HM was devastating. The operation was applied (used) but the theory behind it was incorrect.

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The participants in this research have significant issues with memory. In the case of HM, he cannot transfer information from his short-term memory to his long-term memory. This means he cannot make new long-term memories. Is it possible to gain consent? Researchers would need to gain consent from the person with memory issues (or their attorney) for the participant, in the same way that a parent would be asked for consent when their child is the participant.