

GCSE Psychology – Paper 1

YEAR 10

Cognition and behaviour



Student revision guide

MEMORY

What you will need to know for the exam:

- Processes of encoding, storage and retrieval
- A study of encoding
- Different types of memory
- The multi-store, including description and evaluation of studies to investigate these explanations of memory
- Primacy and recency effects in recall
- Memory as an active process, Bartlett war of the ghosts and the theory of reconstructive memory
- Factors affecting the accuracy of memory including interference, context and false memories



Encoding (input): changing information so that it can be stored.

Storage: holding information in the memory system.

Retrieval (output): recovering information from storage.

Encoding



Visual encoding: Memories stored visually

Acoustic encoding Memories stored in terms of what they sound like

Semantic encoding Semantic refers to meaning - this is your ability to understand words and concepts

Other encoding: tactile encoding for what things feel like and olfactory for smells

Baddeley - a study into encoding

Aim: To see if there was a difference in the encoding of short term and long term memory.

Method: There were 5 groups of participants. Each was given a list of different words to learn. The words were read out loud to the participant every 5 seconds. After each set of 5 words they were asked to immediately recall them in the correct order. Groups A and B did this. Groups C and D recalled their words after 20 minutes.

Results: Baddeley found participants did worse with list A than B (words below). He also found they did worse with list C than list D.

Conclusion: STM is encoded acoustically as list A had acoustically similar words. Participants got the words muddled up so they must have been thinking in terms of the sounds of the words. List C had semantically similar words (they all have a similar meaning) suggesting that information is encoded semantically if not recalled right away (LTM)

List A: - cat, can, cab, cad, cap etc

List B - pit few cow pen etc

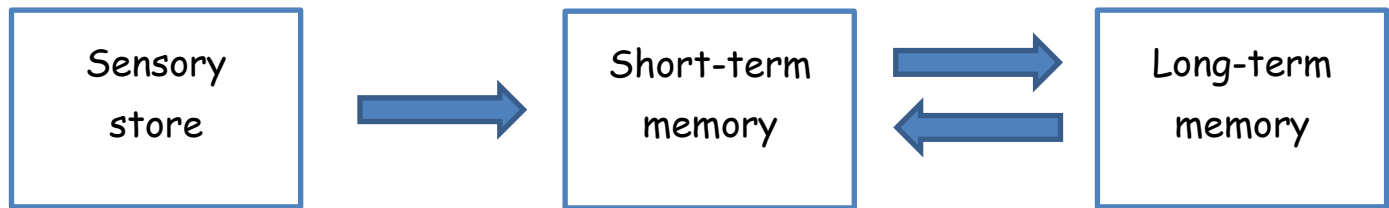
List C - great large big huge broad etc

List D - good huge hot safe thin deep etc

Evaluation of Baddeley

- ✗ Lacks ecological validity because memory in real life does not usually consist of remembering lists of words.
- ✗ A controlled experiment so the results are valid. The study was in a lab so other variables have less of a chance of effecting the results
- ✓ May not have been measuring LTM - he asked them to recall after 20 minutes. Is this LTM? People may not have been able to recall the words the next day so he may not have been testing what he wanted to.

Multi-store Explanation



EXAM TIP:

When asked to identify a feature (for example, a feature of the multi-store model), this means that you must name it. Then, to describe it, you must say something about that feature.

Sensory store

Short-term
memory

Long-term
memory

Duration: Less than a second

Capacity: high capacity - all of the 5 senses pass information to it

Coding: depends on sense eyes is visual, ears is

Duration: less than 30 seconds unless rehearsed

Capacity: Approximately 7 chunks of information 5 ± 2

Coding: acoustic

Duration: Up to a lifetime

Capacity: Unlimited

Coding: Semantic

Evaluation of Multi-store model

- ✗ Lacks ecological validity because memory in real life does not usually consist of remembering lists of words.
- ✗ Not everything needs to be rehearsed; many everyday events can be easily remembered and many things that are rehearsed are forgotten if you don't understand them.
- ✓ The model is too simple. Research has shown STM is divided into separate visual and acoustic stores making our memory far more complex than this model suggests.
- ✓ Baddeley supports the idea that STM and LTM are separate as they are both encoded differently.

Primary and recency effects on recall

Murdock (1962)

Aim: To see if memory of word was affected by the amount of words you have to remember

Method: Murdock randomly selected 4000 words from the most common words in English. 103 students on a psychology course took part in the study. They took part in a number of different sessions. In each session they listened to 20 word lists, each containing different words. The words varied in length from 10 to 40 words. After each list the pp had to recall the words they had just heard.

Results: The words at the end of the list were recalled first (known as the recency effect). Words from the beginning of the list were also recalled quite well (known as the primacy effect), but the middle words were not recalled very well at all.

Conclusion: Murdock concluded that this provides evidence for separate short-term and long-term store as the words they heard first had been rehearsed so had passed to the LTM store and the most recent words were still in their STM. The position of a word effects how likely it is to be recalled (serial position effect)

Evaluation of Murdock

- ✗ Lacks ecological validity because memory in real life does not usually consist of remembering lists of words.
- ✗ A controlled experiment so the results are valid. The study was in a lab so other variables have less of a chance of affecting the results. IV and DV are controlled
- ✓ Research has shown people with amnesia can't store long term memories and also do not show a primacy effect but they do show a recency effect confirming that primacy effect is linked to LTM.

Processes: Different types of memory

Long term memory

Episodic memory - Memories from events. What you have done and what experiences you have had. E.g. a gig you went to last week, your birthday party etc. these memories are time stamped.

Semantic memories - It is the meaning of everything you know, knowledge that is shared with others. E.g. Paris is the capital of France, England winning the world cup in 1966. These are not time-stamped.

Procedural memories - muscle memory. Remembering how to do things e.g. ride a bike. We can recall these without conscious awareness or a great deal of effort.

Evaluation of LTM

- ❌ Clive Wearing - a case study where he could still play the piano (procedural memory) but had almost all of his past showing different types of memory.
- ❌ HM case study also supports this. He had his hippocampus removed and he could recall how to do things but not recall events from the past.
- ✅ Research has shown that the different types are in different parts of the brain. Episodic and semantic in the prefrontal cortex (episodic in the left and semantic in the right) procedural has been found in the motor cortex.

Reconstructive Memory

We may reconstruct what we think we saw or processed to help us retrieve it from long-term memory.

Bartlett (1932)

Aim: To see if people, when given something unfamiliar to remember, would alter the information. To use a story from a different culture to see how cultural expectations affect memory

Method: Participants were asked to read a story called 'The War of the Ghosts', which was a Native American legend. After 15 minutes they were asked to retell the story as accurately as possible. Then he showed a new version to another participant and asked them to recall it a short time later. This retelling was repeated several times during the weeks that followed.

A key feature of the study was it belonged to a culture that was very different to the pps. His participants were from his university in the UK.

Results: Bartlett discovered that his participants found it difficult to remember bits of the story concerned with spirits and changed other bits of the story so that it made more sense to them. Each time they retold the story they changed it some more.

The story was shortened, phrases were changed to fit the pps own culture e.g. "boats" instead of "canoes"

Conclusion: Bartlett concluded that our memory is influenced by our own beliefs and these beliefs and fragments make the material easier to remember.

EXAM TIP:

When you are asked to describe a study, you must always state the aim of the study, the method used, the results obtained and the conclusion drawn. You must include all four elements in your answer to receive all of the marks.

Evaluation

✗ It would be very difficult to measure the accuracy of the stories told with a reliable scoring method. - the participants were not given specific details about what they needed to do.

✔ This study is more relevant to the way we use memories in everyday life, so it has ecological validity, however, the story was unusual does not reflect everyday processes.

Bartlett interpreted his own data so may have affected the way his behaviour should be interpreted.

The theory of reconstructive memory

Memory is inaccurate - Bartlett changed the notion that we can recall any event without altering it in any way. He proposed memory was an active process. We store fragments of information and when we need to recall something we build these fragments into a meaningful whole

Reconstruction - We change our information before we store it in our LTM. We "record" small pieces of information and then later, when recalling the event, we recombine the pieces to tell the story.

Social and cultural influences - People transform parts of a story or picture based on their cultural expectations. This changes how they recall information. Bartlett called this "the social psychology of remembering"

Effort after meaning - People recalled the general meaning of the events rather than the specific meanings in the War of the ghosts story. Bartlett used the phrase "effort after meaning" to describe this. He meant 1. We focus on the meaning of events and 2. Afterwards we try to interpret the meaning of the events into more familiar fragments.

Evaluation

Bartlett tested memory using specific materials which could test memory in everyday life unlike trigrams and most other memory research. Bartlett is more relevant to real-life memory processes.

Not all memories are inaccurate or affected by social expectations.

This information can be used to explain problems in Eye witness testimony. Bartlett helped to highlight that memories may not be accurate after all.

Accuracy of memory - Interference

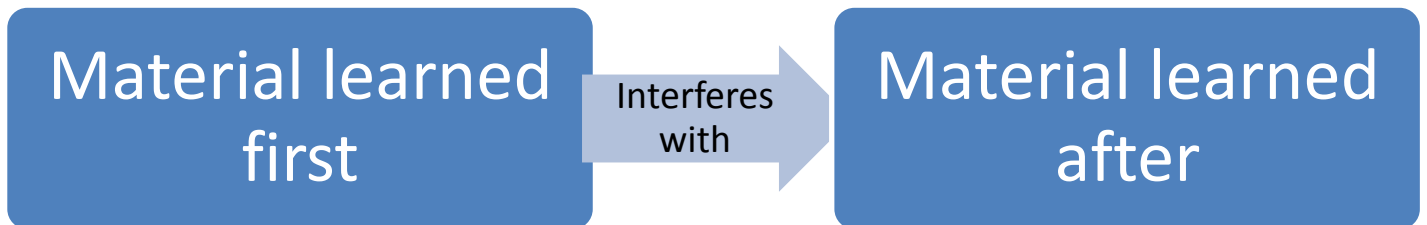
KEYWORDS

Interference: Things that we have learnt that make it difficult to recall other information that we have learnt

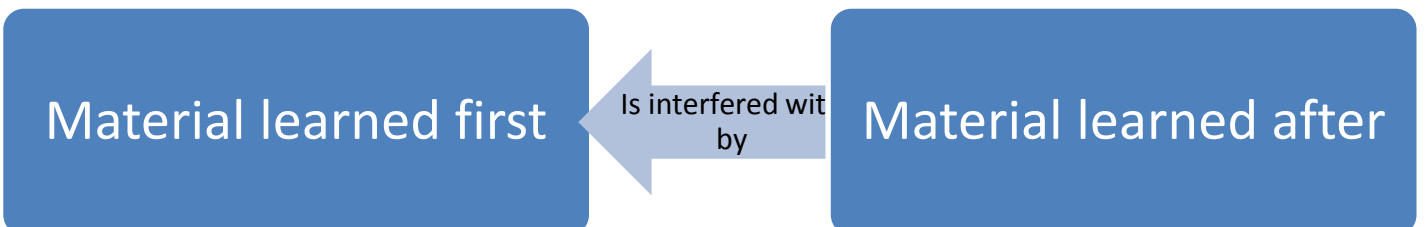
Proactive interference: When information we have already learnt hinders our ability to recall new information

Retroactive interference: When information we have recently learnt hinders our ability to recall information learnt previously

Proactive interference



Retroactive interference



McGeoch and McDonald's study

Aim: To see what affect a second activity has on the accuracy of memory

Method: Participants were asked to learn a list of 10 words until they could remember them with 100% accuracy. They were then shown a new list. 12 participants were used.

There were 5 different lists shown to participants

List 1 - synonyms - words with the same meanings as the originals

List 2 - antonyms - words with the opposite meanings to the originals

List 3 - words unrelated

List 4 - nonsense syllables

List 5 - three-digit numbers

Results: When the participants were asked to recall the original list of words, their performance depended on the nature of the second list. The more similar the material, the less accurate the recall

Conclusion - interference is strongest when an intervening activity is similar.

Evaluation of McGeoch and McDonald

- ❌ Lacks ecological validity because memory in real life does not usually consist of remembering lists of words.
- ❌ A controlled experiment so the results are valid. The study was in a lab so other variables have less of a chance of affecting the results. IV and DV are controlled
- ✅ Not really forgetting - It is possible that interference effects are just temporary and that the information is not actually forgotten.

Accuracy of memory - Context

Godden and Baddeley (1975)

Aim: To see if people who learn and are tested in the same environment will recall more information than those who learn and are tested in different environments.

Method: 18 Participants who were deep-sea divers were recruited. They were divided into four groups. They were given 36 unrelated words either on a beach or under 10 feet of water. All of the groups were given the same list of words to learn:

- Group 1 had to learn underwater and recall underwater
- Group 2: had to learn underwater and recall on the shore
- Group 3 had to learn on the shore and recall on the shore
- Group 4 had to learn on the shore and recall underwater

Results: Groups 1 and 3 recalled 40% more words than groups 2 and 4.

Conclusion: Recall of information will be better if it happens in the same **context** that learning takes place.

Group 1



Learn



Recall

Group 2



Learn



Recall

Group 3



Learn



Recall

Group 4



Evaluation of Godden and Baddeley

- ✗ Lacks ecological validity because memory in real life does not usually consist of remembering lists of words.
- ✗ The recall was short-term. If we want to study the effect the context really has they should have asked them to recall the information later on.
- ✓ The context of being underwater is not realistic - in reality the information people need to know for an exam is usually learnt in multiple contexts and is not affected by one specific context.

Accuracy of memory: False memories

Loftus & Pickrell

Aim: To see if false memories could be created in pps through suggestion in order to test the existence of repressed and false memories

Method: There were 24 participants in the study. A relative was also contacted for each pp. The pps were given 4 short stories about childhood events that had been obtained from their relatives. Three of the stories were true and one was false. The false story was about getting lost in a shopping mall in their childhood and being rescued by an elderly woman. The false information was crafted from the information given by the relative e.g. the relative said what the child's favourite story was etc. Each child was asked to read each story and write down what they remembered about each event. A week or 2 later they were interviewed about the stories. They were interviewed a second time and then debriefed.

Results: IN total there were 72 true episodes to be remembered and pps remembered 68% of these. 6 of the pps (25%) recalled the false story fully or partially. 19/24 participants correctly guessed the lost in the mall memory as false.

Conclusion: The research suggests that the mere act of imagining the event has the potential to create and implant a false memory in a person. This affects the accuracy of memory.

Evaluation

- ✗ Lacks ecological validity because memory in real life does not usually consist of remembering stories - the story about a mall is not a traumatic event so may affect the results
- ✗ Ethical; issue - pps may be left with implanted memories. Even though they did a debrief at the end people may be left or have lingering sense that it happened. This is manipulation.
- ✗ Had real life application for eye witness testimony. Such research into leading questions and false e memories has changed the way courts deal with EWT - it is no longer regarded as being a reliable.

Perception

What you need to know for the exam:

Content	Additional information
Sensation and perception	The difference between sensation and perception.
Visual cues and constancies	<p>Monocular depth cues: height in plane, relative size, occlusion and linear perspective.</p> <p>Binocular depth cues: retinal disparity, convergence.</p>
Gibson's direct theory of perception - the influence of nature	<p>The real world presents sufficient information for direct perception without inference.</p> <p>Role of motion parallax in everyday perception.</p>
Visual illusions	<p>Explanations for visual illusions: ambiguity, misinterpreted depth cues, fiction, size constancy.</p> <p>Examples of visual illusions: the Ponzo, the Müller-Lyer, Rubin's vase, the Ames Room, the Kanizsa triangle and the Necker cube.</p>
Gregory's constructivist theory of perception - the influence of nurture	Perception uses inferences from visual cues and past experience to construct a model of reality.
Factors affecting perception	<p>Perceptual set and the effects of the following factors affecting perception: culture, motivation, emotion, expectation.</p> <p>The Gilchrist and Nesberg study of motivation and the Bruner and Minturn study of perceptual set</p>

- ✔ **Sensation - The information we receive through our senses**

Perception:

- ✔ How we interpret or make sense of the information we receive.
- ✔

The difference between them:

- ✔ The Difference between feeling and thinking. Sensation is our body's way of detecting a stimulus in the environment and perception is how our brain organises and interprets this information.

EXAM TIP:

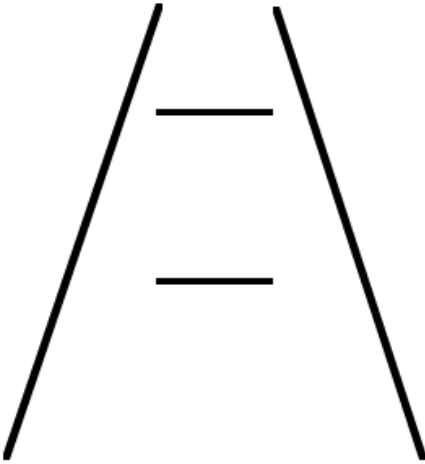
When distinguishing between two terms, remember that examples could be helpful and could earn extra marks.
Remember to use 'whereas' to distinguish between the two definitions.

Theories of perception:

- ✗ Need to know Gibson's direct theory of perception and Gregory's constructivist theory

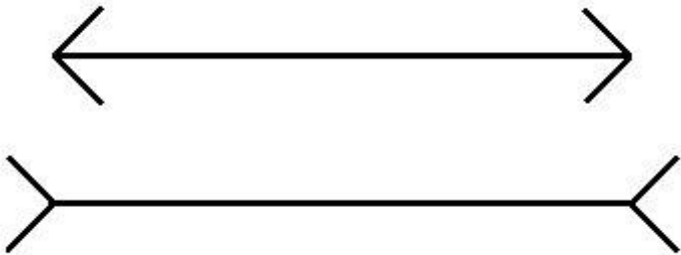
Visual Illusions

KEYWORDS



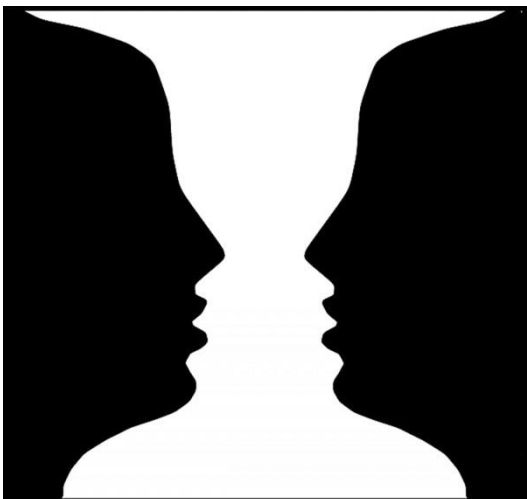
The Ponzo illusion

This is an example of a misinterpreted depth cue. The horizontal line higher up the image appears longer than the horizontal line towards the bottom.



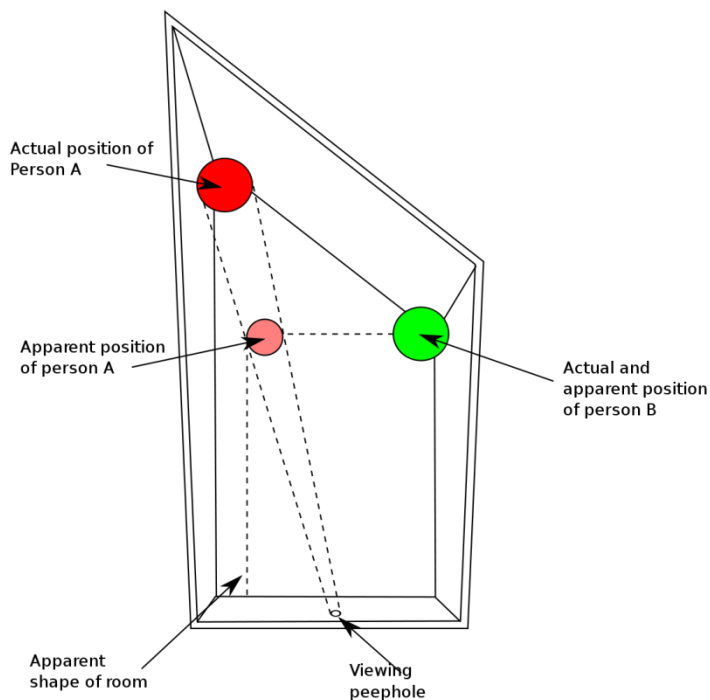
The Muller-Lyer illusion

This is an example of a misinterpreted depth cue. The vertical line with outgoing arrows or fins is perceived as longer than the other. They are the same size.



The Rubins vase illusion

This is an example of an ambiguous figure. It can be seen as a vase or 2 faces. After staring at this for a few seconds you should be able to perceive either.



The Ames room illusion

This is an example of a misinterpreted depth cue. The trick for this is the shape of the room. The people appear to be stood next to each other whereas actually is much further back and people perceive them as being much smaller than the other.

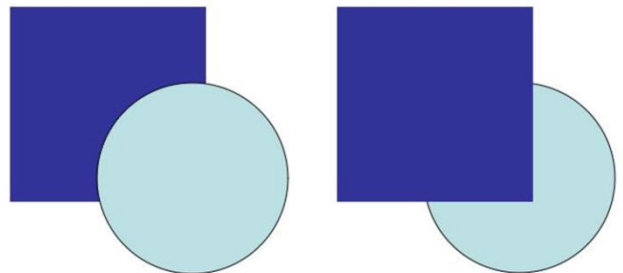
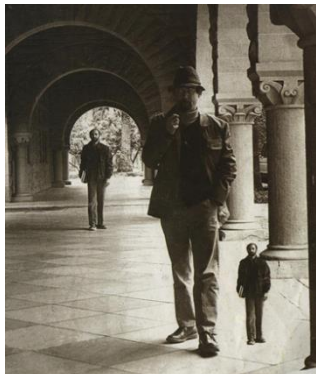


How do we perceive?

Monocular depth cue - a way of detecting depth or distance, which will work with just one eye

Binocular depth cue - a way of detecting depth or distance, which requires two eyes in order to work.

- There are different ways of detecting depth or distance: Monocular depth cues
 - *Height in plane* - Objects higher up in the visual field appear further away
 - *Relative size* - Smaller objects in the visual field appear further away
 - *Occlusion* - Objects that obscure (hide) or are in front of others appear to be closer
 - *Linear perspective* - When parallel lines converge (come together) at some point on the horizon
 - This point is known as the vanishing point



Binocular depth cues -

Convergence - a form of depth perception which uses how eye muscles focus on images

Retinal disparity - a form of depth perception which compares the images from two eyes, side to side.

Gibson's direct theory of perception

A01

Gibson stated that perception is innate and that we are born with the ability to perceive rather than it being a skill we learn through experience. He said everything in our optic array gives us all the information we need to be able to judge depth, distance and movement. For example, our eyes detect optic flow patterns which let our brains know we are moving. Gibson thought binocular and monocular cues were needed so that we are able to judge depth and distance accurately. One cue is motion parallax where objects that are closer to us in our visual field are moving further away.

KEYWORDS

Motion parallax - the way the visual field changes with movement, with close objects seeming to move more than objects further away.

Evaluation

A strength of Gibson's theory is that it has real world meaning as his research was based on experience from pilots from the second world war. This makes the theory more relevant to explain how we perceive on a daily basis.

On the other hand, a weakness of his theory is that it struggles to explain visual illusions as Gibson said that we always perceive accurately but illusions show this is not always the case. This shows there are some aspects of perception that his theory cannot explain.

Support for the idea we are born with the perceptual ability comes from Gibson and Walk who found that very few young children would crawl off a visual cliff. This suggests that their depth perception ability is innate as they were too young to learn it.

Gregory's constructivist theory of depth perception

A01

- The constructivist theory of perception argues that our past knowledge and experience is important in making sense of what is around us. Perception works by making reasonable guesses about what we see, on the basis of what it is likely to be.
- Gregory studied with Bartlett and this theory about perception was influenced by him
- He believed that perception works by making reasonable guesses about what we see, on the basis of what it is most likely to be - this is called making *inference*

KEYWORDS

A Perceptual hypothesis - These conclusions tend to be the most probable explanations for the visual information we are receiving

A mistaken hypothesis - Sometimes the brain draws the wrong conclusion from the available evidence

Evaluation

Nurture plays a key role - the Muller-Lyer illusion to non-Western pps who had not grown up in the same built environment, they did not perceive one line as longer than the other.

This theory can explain 2D images, however, struggles to explain perception in the real world.

Gibson and Walk who found that very few young children would crawl off a visual cliff. This suggests that their depth perception ability is innate and contradicts this theory

Culture research supports that nurture plays a part in perception and perceptual set.

What factors affect our perception?

You need to know about culture, motivation, emotion and expectation (including key studies)

A Perceptual set - is the tendency of our brain to notice, or prefer, certain aspects of the sensory environment. This means other aspects are noticed less or ignored altogether.

Culture

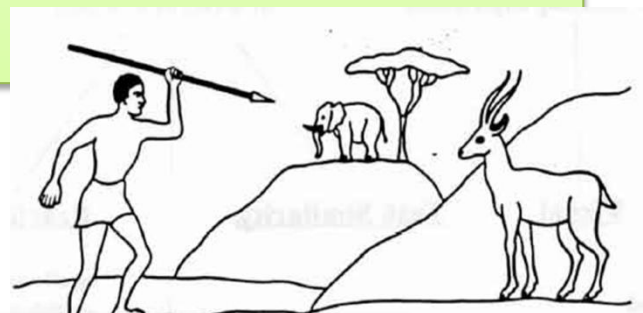
Hudson

Aim: To see if culture can affect depth cues

Method: Showed 2D drawings to people from different cultures. Native black, South Americans were either schooled or unschooled and white Europeans who were either schooled or unschooled. They were asked 1. What do you see? 2. What is the man doing? 3. Which is the nearer, the man, elephant or antelope?

Results: Many people replied elephant. Both black and white schooled pps were more likely to perceive depth perception than unschooled pps. This was linked to height in plane and relative size.

Conclusion: In school pps probably had more exposure to 2D images and were more likely to have learnt how to interpret these images. Children in South Africa at the time were probably more likely to have had access to books and magazines as well which would make it easier for them to interpret these images.



Evaluation

Interpretations may have been a problem as some of the pps may not have understood what was being asked of them.

The material is a 2D image which could have been a problem. People in different cultures may have found it more useful to use something which they are used to having in their environment.

This study is out of date - it was done over 50 years ago so the findings may be different today.

Emotion



McGininnies

Aim: To see does it take longer to recognise words and say them when embarrassed

Method: 8 male and 8 female pps were used. Some were shown neutral words on a screen . Others were mildly offensive e.g. bitch. Each word was presented one at a time and they had to say it out loud as soon as they recognised it. The GSR was measured.

Results: People took longer to recognise the offensive words than the neutral ones. The taboo words produced a bigger response on the GSR.

Conclusion: Emotion is a factor in perceptual set. The higher level of anxiety (measured on the GSR) is associated with the taboo words and slows down the recognition of words. Our brains when confronted with the words that are offensive or cause embarrassment block them out, if even for a moment.

Evaluation

A scientific measure was used to measure the GSR (Galvanic skin response) making this method reliable and not biased.

The delay with the taboo words could have been explained through awkward rather than embarrassed. This is a confounding variable.

Other studies contradict these results.



Motivation

Gilchrist and Nesberg

Aim: To see what affect food deprivation would have on the perception of food-related pictures.

Method: 26 undergraduates took part in this experiment. They were deprived of food for 20 hours before the study. There was also a control group which were not deprived of food before the study. The pps were shown 4 slides of a meal (spaghetti, steak, hamburgers or fried chicken). Each slide was shown for 15 seconds and they were told that this was an exercise to match the pictures. After each slide the projector was turned off and, and then turned on this time dimmer. The pp was asked to adjust the lighting knob so that the picture looked the same as it did before.

Results - the way that the food deprived pps adjusted the lighting suggesting that they had perceived the food pictures as brighter than they actually were. The control group did not do this.

Conclusion: Hunger is a motivating g factor that affects perception.

Evaluation

Some other research supports this study

Unethical - food deprivation could be criticised on ethical grounds. They may have experienced discomfort, however, they did give consent to take part in this study.

This study is not very true to life - lacks ecological validity. Judging pictures is not something you would normally do in an everyday situation.

Expectation

Bruner and Minturn

Aim: To see whether an ambiguous figure was affected by the context it is shown in

Method - The ambiguous figure they used could either be perceived as being a B or 13. They used an independent groups design. PPs were either shown a sequence of letters ie from top to bottom in the diagrams below, or from left to right. In each case the stimulus in the middle was the same and pps had to report and also draw what they had seen.

Results - The group that saw letters were more likely to report a B, whereas, the group that saw numbers were more likely to report a 13.

Conclusion: Expectation has an important influence on perceptual set.



Evaluation

This study is not very true to life - lacks ecological validity. Judging pictures is not something you would normally do in an everyday situation.

Independent groups design - participant variables between the groups could have affected the score

It explains all the errors people can make supporting Gregory's constructivist theory of perception - as he stated people come up with a hypothesis to test as perception is an active process

Development topic

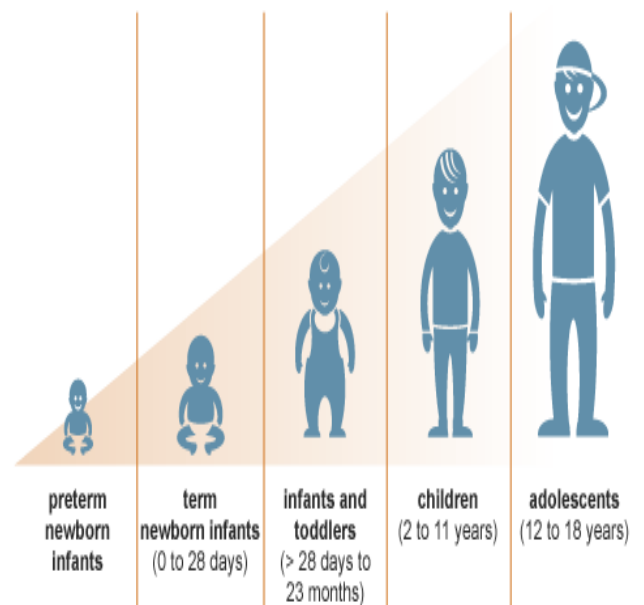
Development

- a specified state of growth or advancement

KEYWORDS

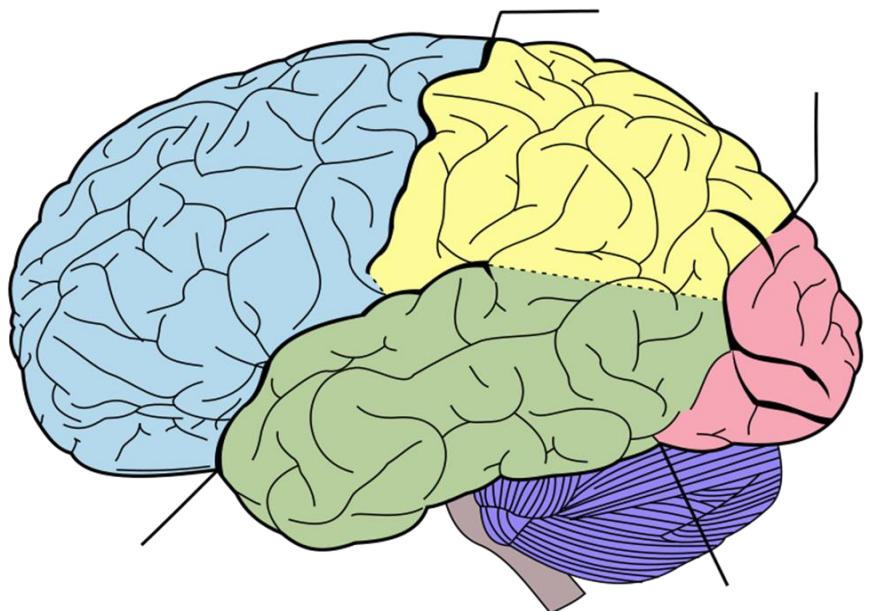
Child development

- Child development means that at certain ages children hit 'milestones' - they are developing physically, cognitively.



Basic outline of brain development

- Frontal lobe - associated with cognitive activities e.g. thinking, planning and problem solving
- Parietal lobe - processes information related to touch on the skin like heat, cold, and pain
- Temporal lobe - hearing
- Occipital lobe - vision



Four key parts of the brain

Brain stem - carries motor and sensory nerves to different parts of the body. It controls many basic life functions such as breathing, heart rate, sleeping and eating.

Cerebellum - Means little brain - Coordination of movement. Located near the top of the spinal cord.

Thalamus - Located deep in the brain. The thalamus passes information from the sense organs to the cortex.

Cortex - the outer layer of the brain where higher cognitive functions take place e.g. speech

The role of nature and nurture

- ✗ Psychologists believe that on the nature side some of your characteristics are inherited from your parents and so is your behaviour.

Those on the nurture side believe that characteristics are influenced by our environment and develop after birth depending on the experiences you have.

Smoking, drinking alcohol and infection are all examples of nurture which can affect someone's development, even when in the womb.

Nature

- The idea that our characteristics are inherited

KEYWORDS

Nurture

- The idea that our characteristics are influenced by our environment

Early brain development

Begins during the third week of pregnancy

The multiplying cells form a structure called the neural plate. This folds over to form the neural tube.

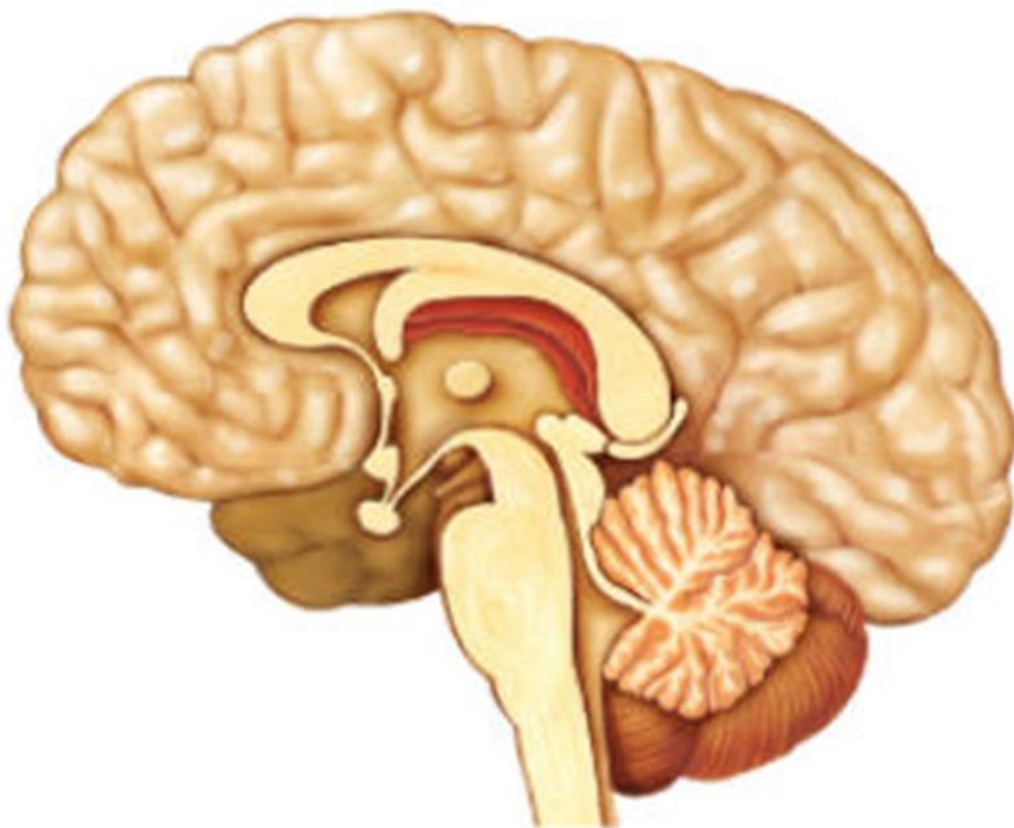
During the fourth week the neural tube begins to divide into the spinal cord, forebrain, midbrain and hindbrain.

During the sixth week the forebrain divides into 2 areas and then goes on to form the cortex. Some of this develops into the thalamus. Neurons and synapses begin to develop into the spinal cord, which allows the foetus to move in the womb.

By the fifteenth week, the cerebellum has formed in the hindbrain. By the sixth month the brain is fully formed (although not at full size)

During the last 3 months of pregnancy, folds begin to form on the cortex. This gives the brain a wrinkled appearance.

At birth the brain is 25% of its adult size.

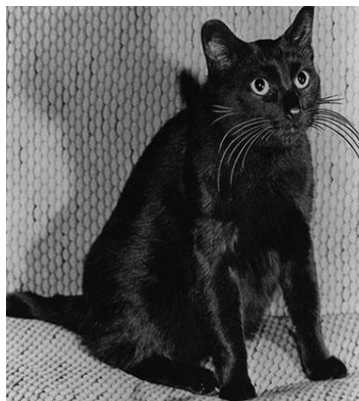


Piaget's theory

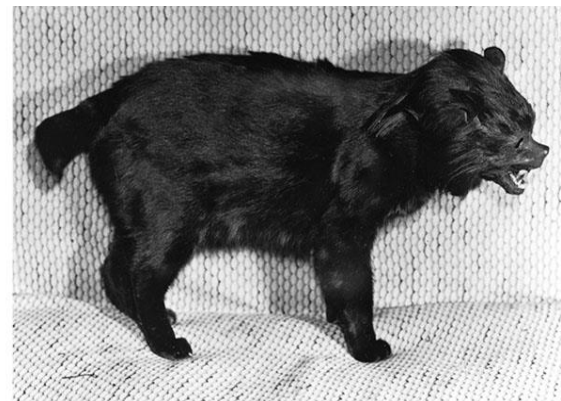
Piaget studies children's cognitive development. He believed that schemas were key to a child's cognitive development and he described how schemas developed as a child grew up.

Before Piaget's theory people thought that young children were the same as adults but they just knew less. They believed that once children developed that knowledge they would be the same as adults.

- Piaget showed that children don't simply know less - they actually think in quite a different way. We have a number of different schemata in our brain that we are constantly adding to throughout our life and when we develop - these develop through assimilation and accommodation.



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Schema - blocks of knowledge that develop in response to our experiences of the world.

KEYWORDS

Assimilation - adding new information to an existing schema

Accommodation - changing a schema, or developing a new schema to cope with a new situation

Evaluation

- ✗ Piaget's theory has led to a lot research being done to test his ideas - e.g. the naughty teddy bear study or the hiding policeman.
- ✗ Piaget's ideas have led to real world applications. His ideas are used in Education to help with teaching in the classroom.
- ✗ He only used middle-class children (he also used his own children). They were also all from where he lived in Switzerland. Therefore we may not be able to generalise his findings to the rest of the population and different cultures.

Piaget's stages of development

KEYWORDS

- Object permanence - Knowing that objects still exist even though they are out of sight
- Egocentrism- not being able to see things from another person's point of view
- Conservation - knowing that the amount of something stays the same, even though its appearance may change

Sensorimotor stage - 0-2 years

In this stage children learn about the world through their senses and through moving about. The main feature of this stage is **OBJECT PERMANENCE** (Knowing that objects still exist even though they are out of sight)

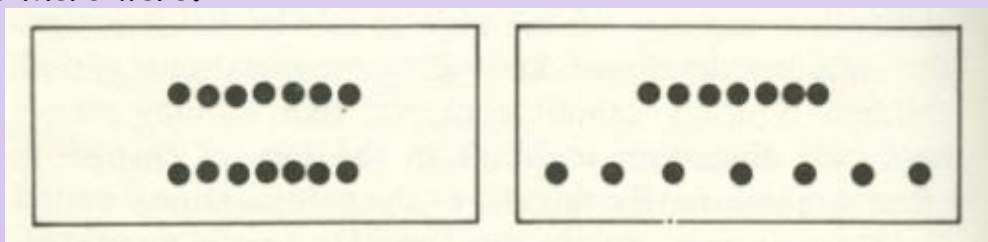
Pre-operational stage - 2-7 years

Main feature is that children become **EGOCENTRIC** in this stage. The three mountain model was used to test this with the children. He found that children under the age of 7 chose a photo that showed their own view, and children 7 or over chose a photo which showed the dolls view. He concluded children are no longer egocentric from aged 7.



Concrete operational stage - 7-11 years

He believed that by the time children were seven they could conserve and were in this stage. To investigate conservation of number, Piaget showed children 2 identical rows of counters. He then asked the child if there were the same amount of counters in each row. When the child agreed there were he then spread out the counters while the child watched. He then asked the child again if there were the same amount of counters in each row. Children under 7 said there were not, children over 7 said there were.



Formal operational stage - 11+ years

The main feature of this stage is that children are able to solve problems in a systematic and mathematical way. Children were given lengths of string and a number of weights which could be attached to the string. The child had to investigate how fast the pendulum would swing. The child had to vary the length of string, and the number of weights attached. Piaget found that children under 11 would attempt to change both the weight and the length of the string at the same time. However, children after 11 would solve the problem systematically. E.g. they would keep the length of the string the same, whilst they changed the weights from lightest to heaviest.

Evaluation

McCarrigle and Donaldson's naughty teddy study contradicts the ages of conservation

Hughes Policeman doll study also contradicts the ages egocentrism occurs suggesting that Piaget's theory is not reliable.

He did a lot of his research on small samples of children, and some of the experiments were conducted on his own children. These samples are unrepresentative and cannot be generalised.

His research has had a major impact on early year's education and his work has led to many other researchers investigating children's cognitive development.

The role of Piaget's theory in education

Piaget believed that a child's intelligence develops from discovering things for themselves. He said that children needed to explore objects and different situations to learn about them. He also added that children would need to be at the right stage of development in order to learn new concepts.

In nurseries and early years at primary schools many of Piaget's suggestions are used. There is a heavy focus on discovery learning with the use of sand pits and water trays etc. to help children discover what items can sink or float. Also, giving children science problems to solve either on their own or in groups, allows them to learn from experiences.

APPLYING PIAGET TO EDUCATION

- Teachers should take a readiness approach and present opportunities for their students to learn new concepts in the right stage of development
- Children should be taught in a "child-centred" way. The children should be allowed to problem solve and discover answers for themselves.
- Materials for Science and Maths should have objects that children can manipulate and change e.g., string and weights to investigate the pendulum task.

McCarrigle and Donaldson's "naughty teddy" study (1974)

THIS IS A KEY STUDY WHICH YOU NEED TO KNOW



Aim: To see if the children developed conservation skills at an earlier age than Piaget found, if the change to the materials was accidental.

Method: A laboratory study in which there was some control of extraneous variables. All procedures were standardised to ensure the study could be repeated. 80 children between the ages of 4 and 6 took part in the study. The children were shown two rows of counters and asked if there was the same amount in each row. Then a glove puppet called "naughty teddy" made an appearance. "Naughty teddy" accidentally messed up one of the rows of counters in front of the child. The messed-up row was spread out to look longer than the other row. The experimenter pretended to really cross with naughty teddy and told it off. The child was then asked if there were the same amount of counters in each row.

Results: 62% of the four to six year olds stated that there was still the same amount of counters in each row, therefore they could conserve. Only 16% of four to six year olds answered the question correctly in Piaget's conservation of number study, when the adult made the change to the counters.

Conclusion: Children younger than the age of 7 can conserve if the change to the counters/materials appears to be accidental. When naughty teddy messes up the row of counters and spreads them out, younger children know the amount of counters has not been changed.

Evaluation

- ✔ Other studies have supported these results. This offers more support to this study compared to Piaget's original findings.
- ✘ The children were tested by an adult stranger in an unusual environment. Perhaps if the adult had been familiar to them and they were in their usual environment, more children between the ages of four to six would have been able to conserve.
- ✘ Over 30% of children still failed to conserve when naughty teddy made the change suggesting that their results are not as valid as first thought.

Hughes "Policeman doll" study (1978) - ANOTHER KEY STUDY

Aim - To see if children can see things from another person's point of view

Study design: A laboratory study in which there was some control of extraneous variables. All procedures were standardised to ensure the study could be repeated. 30 children between the ages of three and a half and 5 years old took part in the study.

Method: The children were shown a model with two intersecting walls that formed a cross. A policeman doll was placed on the model. The child was asked to hide a boy doll so the policeman doll could not see him.

The policeman was then placed in different positions on the model, and the child was asked to hide the boy each time. This was to ensure the child understood the task. If the child made mistakes, they were told and allowed to try again. This was rarely necessary as the children seemed to understand the task straight away.

Then the actual experiment began. Another policeman doll was placed on the model and the child was asked to hide the boy doll so that neither policeman doll could see him. This was repeated three times so that a different section of the grid was left as the only hiding place each time.

Results: 90% of the children aged between three-and-a-half and five years were able to hide the boy doll from the two policeman dolls.

Conclusion: children aged between three-and-a-half and five years can see things from someone else's point of view, if the situation is familiar to them, and the task makes sense. This was different to Piaget's finding that children are egocentric until they are seven.

Evaluation

- ✔ This study made much better sense to the children than Piaget's original study did as the policeman task was a task that the children would be more likely to experience in everyday life, rather than the three mountains task.
- ✔ One strength is that this key study challenges Piaget's original findings.
- ✘ The researcher may have unconsciously hinted about the correct answer which would make this study lack validity.

Dweck's mindset theory of learning

- This theory explains how children can achieve success in their learning
- Dweck specifically talked about maths and science but it can be applied to all subjects.
- When a student is faced with a challenge, the type of mindset they have will affect how they are going to deal with it.
- Fixed mindset - will give up very quickly
- Growth mindset - will keep on trying which will increase their chances of succeeding.
- Changing mindsets - These can be changed through training
- In one study, students were taught about what happens in their brain each time they learn something new and difficult. These students showed a major improvement in their exam results, compared to a control group who did not receive the lesson.
- Examples of changing mindsets - I'm just not good at math (fixed) -With help and persistence, I can improve my understanding of math. (growth)
- I can't do this (fixed) - I am still learning how to do this. (growth)

KEYWORDS

- **Fixed mindset** - Students believe that their intelligence is unchanging. They believe it is genetic and there is nothing they can do to change it.

Growth mindset - students believe their intelligence comes from hard work. They believe it can be increased by putting more time and effort into learning.

The role praise on learning

Dweck believes that the type of praise or positive feedback a student receives from their teacher affects their mindset. She suggests there are 2 types of praise:

Person praise - the student is praised for their intelligence e.g. they are told that they are clever or that they are a great mathematician.

Process praise - the student is praised for their effort and the processes they use to complete a task. E.g. praised for the strategies they use or the progress they have made.

Students who receive person praise believe that their successes and failures are something beyond their control. Students who receive process praise believe their successes and failures are due to the amount of effort they put in.

Study - students were given an online maths game to play that gave them feedback on their effort, strategy and progress. This was different to the usual maths games that provided scores as feedback. It was found that with this new game, students made more effort, used more strategies and persevered for longer. It was concluded that the type of praise a student receives has a high impact on their learning.

Evaluation

- ✔ This study helps us to understand how students can increase their exam grades
- ✔ It informs teachers that students mind-sets can be changed and explains how they can change them
- ✔ Studies like the one above support Dweck's theory

The role of self-efficacy in learning

- Self-efficacy is the belief in your own ability to succeed at a task. A student with a strong self-efficacy puts in effort to achieve goals. They will challenge themselves with difficult tasks, and are likely to be successful. A student with low self-efficacy believes they will not be successful and will not try. Students increase self-efficacy by:
 - Being successful at something
 - Observing other people succeed at something due to their effort
 - Being guided through a task
 - Being persuaded they can achieve by a role model such as a teacher.

Learning styles (VAK)

- First of 3 different learning styles -
- Visual - learn best by reading or seeing pictures. They like to see what they are learning. They remember things by what they look like
- Auditory - Learn best by listening. They like to hear something, speak it or learn it. They remember what they have heard
- Kinaesthetic - Learn best by doing something. They like to move or make what they are learning. They remember best when some type of physical activity is involved.
- Another theory: Calls learners verbalisers and visualisers.
- Verbalisers - process information verbally. They prefer to learn from written information, and they like to write things down. They think using words.
- Visualisers - process information visually. They prefer to learn from pictures and diagrams. They think using patterns.

Willingham's learning theory and his criticism of learning styles

Willingham disagrees with the idea of learning styles and that a person should be taught in a way that matches their preferred learning style e.g. VAK. In his theory he points out that there is no experimental evidence to support their existence. Studies have actually showed that learning in their preferred learning styles has no effect on exam results.

Willingham argues that many students may have better visual or auditory memory, but it does not help them in the classroom. This is because teachers usually want students to remember what things mean not what they look or sound like. The student should extract the meaning of information, not store what it looks or sounds like. This may explain why teaching in a person's preferred learning style does not affect their exam performance.

Willingham believes that students should be taught with the best method for the content being taught. E.g. when learning about the brain all of the student should be given a diagram of the brain and not just the visual learners.

In Spanish - all of the learners would need to hear the words being pronounced and not just the auditory learners. Willingham believed that all learners should be given the opportunity to practice dealing with different types of information.

Evaluation

- ✔ Willingham uses scientific research which are all related to learning so this means that we can trust his conclusions
- ✔ It has been specifically applied to applications to learning. This means his research has real-world value. (Learning styles do not affect exam performance.)

Check your understanding

1. Identify one part of the brain which has been shown to affect the development of movement. (1 mark)
2. Briefly explain the function of the thalamus (3 marks)
3. Explain how accommodation might occur when a child recognises that a small fluttering creature is not a bird, but is told it is a butterfly. (3 marks)
4. Describe and evaluate Piaget's theory of development. (9 marks)
5. Use your knowledge of conservation to explain how the thinking of a seven year old may differ from a five year old (3 marks).
6. Briefly outline what the participants were asked to do in the "Hughes policeman doll study" (2 marks)
7. Explain one evaluation of Hughes "policeman doll study" (3 marks)
8. Using an example of behaviour, distinguish between a fixed and growth mindset (4 marks)
9. Evaluate Willingham's learning theory (5 marks)

Research method checklist

Content	Additional information
Variables	Independent variable, dependent variable, confounding or extraneous variables
Hypothesis	Directional or non-directional
Quantitative and qualitative data	Know each type of data and specify the difference between the two types. Strengths and weaknesses of each type.
Primary and secondary data	Know each type of data and specify the difference between the two types. Strengths and weaknesses of each type.
Laboratory and field experiments	Strengths and weaknesses of each type
Sampling	Opportunity sampling Random sampling Systematic sampling Stratified sampling
Experimental design	Independent groups Repeated measures Matched pairs
Ethical issues	Informed consent Deception Protection from harm Privacy Confidentiality AND ways to deal with them
Interviews and questionnaires	Structured, semi-structured and unstructured interviews. Open and closed questions
Descriptive statistics	Mean, median, mode and range. Strengths and weaknesses of using each type.

