

YOUR GUIDE TO A 7

IB PSYCHOLOGY HL FULL PAPER 1 NOTES

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Page 1 of 42



ALL YOU NEED TO KNOW FOR IB PSYCHOLOGY PAPER 1

From an IB Psychology HL '7' graduate

Cognitive Level of Analysis

Cognitive Level of Analysis (CLOA) is based on how mental processes in the brain process information. It concerns the way an individual takes in information from the outside world, how they make sense of that information and what use they make of it.

Cognition refers to a process that is based on a person's unique mental representation of the world that has been constructed around their experiences.

Principles of the CLOA

There are multiple principles to the CLOA. Three that we will be focusing on are:

- Cognitive processes can be scientifically investigated. C1
- Mental representations guide behaviour. C2
- Cognitive processing can be compared to computer function. C3

Schema Theory

A **schema** is a mental representation of classes or categories of people, objects, events, and situations. Schemas are made up of acquired knowledge. The purpose of a schema is to simplify detail, speed up processing, help in interpreting and memorising and allow the evaluation of new information.

Schemas are principle C2 of the CLOA.

Schema theory is based on the assumption that people are active information processors that interpret and integrate information to make sense of experiences. People's prior knowledge will influence the outcome of information processing. When information is missing, the brain fills in blanks using cognitive distortions. *Cognitive distortions* occur when the settings are unfamiliar or when the wrong schemas become activated. Categorisation based on schemas requires less effort and schema processing can affect memory at all stages of memory.

Reconstructive memory proposes that schemas fill in the gaps of information in order to make more sense of what happened.

Assumptions of schema theory:

- Schemas are mental representations that guide our behaviour.
- Cognitive distortions fill in the gaps in our memory.

STUDY: Bartlett (1932)	
AIM:	The aim of Bartlett (1932) was to investigate whether people's memory for a story is affected by schemas and the extent to which memory is reconstructive.
METHOD:	British participants were asked to read the Native American Indian story "War of the Ghosts". They were asked to recall the story using two techniques, serial reproduction (people telling the story to another person) and repeated reproduction (people telling the story to themselves).
RESULTS:	The results found that the participants had distorted the story around their own experiences, knowledge, expectations & beliefs. The participants' memory of the story was shaped by their culture and less importance was placed on ghosts, as this was not a major aspect of their culture. The more the participants reproduced the story, the more it gained British influence and the shorter it became in length. Some participants changed certain aspects that were culturally unfamiliar into more familiar ones (e.g. 'canoes' changed into 'boats' and 'hunting seals' became 'fishing').
CONCLUSION:	It can be concluded that the participants' schemas affected their memory of the story by making the story fit in with their culture more.
EVALUATION:	Researchers observed cognitive distortions → high validity Naturalistic task of getting told a story and recalling it → high ecological validity Experiment and lab setting → low ecological validity Only British culture was investigated → cultural bias and low representational generalisability
LINK:	Therefore, this study supports the schema theory because the participants' prior knowledge influenced their information processing through cognitive distortions.

Evaluation of MSM

STRENGTHS:

A strength of the MSM is that it provides support for anterograde amnesia, which is an inability to form new memories. For example, the HM case study found that by removing the patient's hippocampus, his STM was still intact but his LTM was damaged, leaving him unable to form new memories. This gives evidence for separate stores of memory, therefore supporting the MSM. This is a strength because the MSM can explain how amnesia occurs.

Another strength of the MSM is that it establishes differences between STM and LTM. For example, Baddeley found that STM is encoded acoustically while LTM is encoded semantically. This is a strength because the research demonstrates the two separate stores (STM & LTM) associated with the MSM.

LIMITATIONS:

A limitation of the MSM is that it is too reductionist, as the theory assumes that STM & LTM are separate stores. However, memory is not that simplistic and the two stores can be interrelated. Memory is a much more complex concept than one store for STM and another for LTM. This is a limitation because the reductionism decreases the validity of the model.

Another limitation of the MSM is that there is evidence of multiple LTM stores. For example, declarative and procedural memory. Procedural memories can be recalled unconsciously; the MSM does not take consciousness into account. This is a limitation because the model cannot be used to fully explain how memory works.

Levels of Processing Model

Another model explaining memory is the *Craik & Lockhart (1972) Levels of Processing (LOP)* model. They proposed the idea of the **depth of processing** where the deeper the level of processing, the easier the information is to recall. There are three types of processing.

- **Structural processing** is encoding the physical features of a word (e.g. whether a word is in all capitals).
- **Phonemic processing** is encoding the sound of a word (e.g. what the word rhymes with).
- **Semantic processing** is encoding the meaning of a word and its relation to other words with similar meanings (e.g. if salmon is a fish).

Shallow processing involves *maintenance rehearsal* and leads to short-term retention of information. Structural and phonemic processing are forms of shallow processing.

Deep processing involves *elaboration rehearsal* which involves a more meaningful analysis and leads to better information recall. Semantic processing is a form of deep processing.

STUDY: Craik & Lockhart (1975)

AIM:

The aim of Craik & Lockhart (1975) was to investigate how deep and shallow processing affects memory recall.

METHOD:

Undergraduate participants were given a list of 60 words and had to answer one of three questions. Some questions required the participants to process the word in a deep way (e.g. semantic) and others in a shallow way (e.g. structural and phonemic). For example, they were asked, 'Is the word in capital letters or lowercase letters?' for structural processing and, 'Does the word go in this sentence?' for semantic processing. The participants were then given a bigger list of 180 words where the original words had been mixed into. They were asked to identify the original words.

RESULTS:

The results found that the participants recalled more words that were semantically processed compared to phonemically and visually processed words.

CONCLUSION:

It can be concluded that semantically processed words involve elaboration rehearsal and deep processing which results in more accurate recall. Phonemic and visually processed words involve shallow processing and less accurate recall.

LINK:

Therefore, this study supports the LOP model as the participants recalled more words that had deeper processing.

Evaluation of LOP Model

STRENGTHS:

A strength of the LOP model is that it can be easily tested by manipulating how information is encoded. This was evident in the Craik & Lockhart study where they changed the way a word is processed (independent variable) in order to measure their memory recall (dependent variable). This is a strength because it results in high replicability.

Brain imaging technologies are principle C1 of the BLOA.

STUDY: Maguire et al. (2000)

AIM:	The aim of Maguire et al. (2000) was to examine whether structural changes could be detected in the brain of people with extensive experience of spatial navigation.
METHOD:	The participants were 16 healthy male licensed London taxi drivers. They were all right handed, were taxi drivers for more than 1.5 years and had around 2 years' worth of training. The experiment was a quasi-experiment with a matched-pairs design. The researchers excluded females, left-handed males, and those with health issues from participating. The researchers matched the taxi drivers with 50 healthy males who did not drive taxis and had similar ages (control group). Structural MRIs were used to show the relationship between brain scans and the length of time the drivers were licensed. Both 2D and 3D measurements were taken.
RESULTS:	The results found that the taxi drivers had more grey matter volume in their left and right hippocampi compared to the control group. The taxi drivers had a larger posterior hippocampus and a smaller anterior hippocampus compared to the control group. There was a positive correlation between the volume of right posterior hippocampus and the time spent as a taxi driver, while there was a negative correlation between the time spent as a taxi driver and the volume of the anterior hippocampus.
CONCLUSION:	It was concluded that the results provide evidence for structural differences between the hippocampi of London taxi drivers and control participants, therefore suggesting that extensive practice with spatial navigation affects the hippocampus.
LINK:	Therefore, the BIT of MRI was used in this study in order to investigate how the taxi drivers' memory (cognitive process) of London affected the structure of their brains.

STUDY: Corkin et al. (1997)

AIM:	The aim of Corkin et al. (1997) was to investigate the extent of the hippocampal and medial temporal lobe damage to a patient's brain and to determine whether this could be sufficient to have resulted in the drastic memory loss suffered by him.
METHOD:	MRI scans were conducted on the patient HM in 1992 and 1993. HM had brain surgery in order to stop his seizures. Before the 1992 scan HM completed an IQ test and a memory test.
RESULTS:	The results found that the lesioning of H.M.'s brain was 3cm less than Scoville had estimated. It did not extend as far into the posterior hippocampus as the researchers thought, although there was surrounding damage to the uncus and the amygdala. Approximately 50% of the posterior hippocampus on each side remained, but this had shrunk considerably on the right side. The researchers believed that this could be due to both the removal of the rest of the hippocampus, and to the drugs and continuing (though much reduced) epileptic seizures. The IQ test found that he had normal intelligence, but the memory test showed his memory quotient was 37 points lower than his IQ. This showed that he had severe amnesia.
CONCLUSION:	It can be concluded that the small amount of hippocampus remaining in the left temporal lobe was not sufficient enough to support normal memory.
LINK:	Therefore, MRI was used in this study in order to investigate how the brain damage affected HM's memory (cognitive process).

MRI Scan Evaluation

STRENGTHS:	A strength of the MRI scan is that it provides high quality 3D images of the structures brain, which results in high validity. Since memory can change the structure of the brain, MRI scans can reveal how the cognitive process alters the brain. This a strength because the structure and processes within the brain are mapped out, which helps in the diagnosis of various conditions (e.g. Alzheimer's disease).
LIMITATIONS:	A limitation is that the MRI scan is very noisy, which can affect the quality of the images. People with claustrophobia and patients with certain diseases may find it extremely difficult to stay still for times between 30 minutes and 1 hour in the scanner, which is required in the procedure. This is a limitation because this could cause anomalies within the images which could decrease reliability.

AIM:	The aim of Carrión et al. (2009) was to observe the function of the brain in children afflicted with PTSD.
METHOD:	27 adolescents between the ages of 10–17 years (16 PTSD and 11 healthy) participated in a Verbal Declarative Memory Task. Parental consent was obtained from all participants. The participants had to encode 40 unique visually presented nouns and retrieve 32 of the same words from a longer list with 16 new words. The encoding task consisted of epochs (group of words presented consecutively as stimuli) of eight words each presented independently. They were asked to remember the words. The retrieval task had the epochs shown word by word to the participants. They were asked to press one of two buttons to indicate whether the word had been presented during the encoding task. fMRI scans were used to measure brain activity.
RESULTS:	The results found that the participants who had PTSD performed worse than the healthy participants. The fMRI scan found that the PTSD group had reduced activation of the right hippocampus during the retrieval component of the task. The participants who performed worse on the test were those who also showed specific PTSD symptoms, such as withdrawal from those who wanted to help them.
CONCLUSION:	They concluded that the impairment of the hippocampus was correlated with avoidance and numbing. Difficulty remembering trauma, feeling cut from others and showing lack of emotion are symptoms of PTSD.
EVALUATION:	Established a cause and effect relationship between PTSD and brain activity → increases validity Symptoms of PTSD → shows that PTSD and brain activity can be a socially sensitive issue Unrealistic task in an fMRI → can be noisy and affect recall → low ecological validity
LINK:	Therefore, the study supports that the environment can affect physiological processes, as the participants who had PTSD had less activation in the hippocampus than the healthy group.

Interaction Between Cognition & Physiology

See Cognitive Level of Analysis.

Physiology is the internal, biological mechanisms of living organisms (the way the organism functions).

Amnesia is the inability to learn new information or retrieve information that has already been stored in memory. There is an interaction between biological and cognitive factors in amnesia. Amnesia has a biological cause (e.g. brain damage) and affects cognition (e.g. memory). In amnesia patients, episodic memory is affected to a greater extent than semantic memory.

- **Episodic** memories are memories linked to a certain time and place.
- **Semantic** memories are memories for the meaning of information.

Amnesia affects the *medial temporal lobe* and the *hippocampus*. There are two types of amnesia.

- **Anterograde amnesia** is the impairment in the ability to recall new information after the onset.
- **Retrograde amnesia** is the impairment in the ability to recall old information before the onset.

Assumptions of interaction between cognition and physiology:

- One area of the brain is responsible for one interaction between cognition and physiology
- Different areas of the brain control different functions and behaviours

STUDY: Scoville & Milner (1957)

LINK: Therefore, this study shows an interaction between cognition and physiology as HM had anterograde amnesia after his hippocampus was removed.

STUDY: Shallice & Warrington (1974)

AIM: The aim of Shallice & Warrington (1974) was to investigate memory in a patient after he suffered brain damage.

METHOD: A case study was conducted that examined KF, who was in a motorcycle accident and suffered memory impairment. He had brain damage to the left parietal and occipital lobes. The researchers conducted 5 experiments testing the impact of brain damage to

STUDY: Fernald, Burke & Gunnar (2008)

EVALUATION:	Large sample size of 639 people → high representational generalisability to the target population of Mexicans in poverty Culturally biased to Mexico → low inferential generalisability IMPROVEMENT: Conduct a cross-cultural study Unclear whether it was the genes or the environment that caused depression → lowers reliability
LINK:	Therefore, the study shows that genetic inheritance influences behaviour to a moderate extent, as the mothers who lived in extreme poverty had children who were more depressive.

STUDY: Nurnberger & Gershon (1982)

AIM:	The aim of Nurnberger & Gershon (1982) was to see if there is a gene responsible for depression.
METHOD:	They conducted a meta-analysis that reviewed the results of 92 adult twins.
RESULTS:	The results found that the concordance rate for major depressive disorder was consistently higher for MZ twins than for DZ twins. Genetic factors might predispose people to depression. The average concordance rate for MZ twins was 65%, while for DZ twins it was 14%.
CONCLUSION:	They concluded that the fact that the concordance rate is way below 100% indicates that depression may be the result of genetic predisposition or genetic vulnerability.
EVALUATION:	Used both MZ twins and DZ twins → checks of consistency between the two types of twins → high reliability Concordance rates was below 100% → unclear what other factors affect depression → lowers validity Meta-analysis has potential for file-drawer bias → could lower validity
LINK:	Therefore, this study shows that genetic inheritance may not be the only influence for depression, as the concordance rates for the MZ twins were less than 100%.

STUDY: Caspi et al. (2003)

AIM:	The aim of Caspi et al. (2003) was to investigate the possible role of the 5-HTT gene in depression after experience of stressful events.
METHOD:	The 5-HTT gene serotonin transporter gene, which is related to the reuptake of serotonin in the synapse. The participants were split into three groups depending on the alleles of their 5-HTT gene (two short alleles, one short and one long allele, two long alleles). A longitudinal study was conducted on 847 participants who were an opportunity sample from a cohort. They were assessed at 26 years old on their depression and stressful life events.
RESULTS:	The results found that the participants with two short alleles in the 5-HTT gene reported more depressive symptoms in response to stressful life events than either of the other two groups. Those participants with two long alleles reported fewer depression symptoms. Childhood maltreatment was predictive of depression in adulthood only in adults with either one or two short alleles.
CONCLUSION:	It can be concluded that the 5-HTT gene could indicate a vulnerability to depression after stress. The long alleles seem to protect against suffering depression, as a result of stress.
EVALUATION:	Longitudinal study → high temporal validity All participants were 26 years old → low representational generalisability Participants may be distressed due to the fact that they are more likely to be depressed → shows that it is a socially sensitive issue
LINK:	Therefore, the study shows that genetic inheritance can influence behaviour to a high extent, as the participants with the mutated 5-HTT gene were more likely to exhibit depressive behaviours compared to the participants with the normal gene.

STUDY: Brown & Harris (1978)

AIM:	The aim Brown & Harris (1978) was to investigate how depression could be linked to social factors and stressful life events in a sample of women from London.
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- Procedure of the study
- Significance of results
- Whether they took into account a holistic approach
- Time period/age of the study

Reliability

- Procedure of the study
- Control/experimental groups and how many in each group
- Number of participants
- Whether a comparison was involved

Credibility

- Whether the data was objective/subjective
- What measures the researchers made to make subjective data more objective
- The research method as a whole

Generalisability

- Whether there was a sample bias (gender bias, culture bias, age bias, etc.)
- Number of participants
- Attrition rate
- Applicability to target population/whole population (*representational generalisability*)
- Applicability to other settings (*inferential generalisability*)
- Applicability to theories (*theoretical generalisability*)
- Applicability to everyday life/certain situations

See Evaluation Glossary for specific terms and their associated words.

Evaluation Bank – Theories

Evaluating theories is much like evaluating a study, but it requires more critical thinking of what a certain evaluative point means for a theory as a whole, such as applicability to psychologists and everyday life.

Testing

- Whether empirical support can be generated to challenge/support the theory
- Whether it is falsifiable (can we prove it wrong?)

Evidence

- How much research has been done on the theory
- How many research methods have been used to test the theory
 - Strengths and limitations of these research methods
- Whether the research supports the theory
- Whether the research is replicable

Applications

- Whether the theory has applications to everyday life and situations
- How much application that the theory has towards other theories and practical situations

Concepts

- Whether the concepts of the theory can be measured (**construct validity**)
- The difficulty of setting up a test to investigate the theory

Unbiased?

- What types of samples has the research been done on? (sample biases)
- Where the research for the theory has been primarily conducted
- Who came up with the theory? (**ethnocentrism**)
- Is the research trustworthy? (**credibility**)

Predictive

- How well the theory predicts behaviour in certain situations in life (predictive validity)