

**ANSWER BOOKLET**  
**LIVRET DE RÉPONSES**  
**CUADERNILLO DE RESPUESTAS**



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4 PAGES / PÁGINAS

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1

Localisation of function in the brain refers to how different parts of the brain have their own distinct functions that correspond to particular behaviours. This is based on the assumption of the biological approach to understanding behaviour that states that behaviour is a product of brain structure. With respect to humans, brain structure includes the cortex, ~~the~~ brain-stem, cerebellum and limbic system, etc. It is seen that when there is a ~~malfunction~~ damage to a particular part of the brain, the corresponding behaviour exhibits a malfunction. This concept is extremely ~~and~~ relevant to understand the functions of the brain. This can be explained by the study on HM by Milner et. al.

When HM was 7, he suffered a serious head injury. By 10, he was having epileptic attacks until adulthood. At 27, a neurosurgeon William Scoville performed an experimental surgery on him with informed consent. He removed a part of HM's medial temporal lobe containing

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the hippocampus. After this he ~~was~~ had anterograde amnesia which is the inability to convert short-term memory to long term memory after an accident, which in this case refers to the surgery. He still remembered events from his childhood, which proves that the hippocampus is not the site for permanent storage of information.

Brenda Milner conducted a longitudinal study on HM until his death in 2001 with the aim to understand the biological reasons behind anterograde amnesia. She did this by method triangulation, which refers to using different research methods to obtain a holistic view of the participant. ~~By~~

Psychometric tests showed that his IQ was high  ~~&~~ above average. Direct observation <sup>and</sup> interviews with HM and his family followed. Cognitive tests like reverse mirror drawing and memory recall tests were done. Lastly, Corkin conducted an MRI scan to see the extent of HM's hippocampal damage.

Results showed that HM lost his ability to create new episodic memory that is memory of events and new ~~and~~ semantic knowledge that is general knowledge about the world. This shows that the ability to convert short-term to long-term memory was lost. He could draw cognitive maps of his house suggesting his spatial memory was intact. This means the ~~top~~

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hippocampus ~~is not~~ does not store spatial memory. His working memory ~~was~~ intact as he could maintain ~~case~~ conversation. procedural memory, ~~like~~ ~~hand~~ hand-eye coordination and motor skills remained intact. His retention had reduced as he could not

remember a number after 15 mins of verbal rehearsal. Lastly, the MRI scan showed significant damage to the hippocampus, which is the site of acetylcholine a hormone and neurotransmitter that aids memory formation.

Through this study, localisation of function of the hippocampus is seen as it is the site of conversion of ~~long~~ short to long term memory, which is the behaviour that had a malfunction in HM due to the damage to the hippocampus. ~~That~~ Having anterograde amnesia is the product of HM's brain structure, proving the assumption of the biological approach to behaviour.

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2.

cognitive schemas are mental representations of our thoughts that influence our beliefs. These schemas ~~can~~ lead to automatic and unconscious behaviour that confirms these schemas. Therefore having schemas saves cognitive energy but could also lead to bias like ~~for~~ social schemas that are biases ~~at~~ about society, scripts that are biases about events and self-schemas that are biases about ourselves. These bias affect remembering that is an active process of retrieval of memory that fit our existing schemas to create meaning. Memory ~~is~~ refers to the encoding, storage, and retrieval of information. Therefore, Bartlett proposed the theory of reconstructive memory that suggests that memories are not copies of events, but rather reconstructions of them ~~to create~~ according to our schemas. This concept is relevant as it ~~tests~~ the reliability of our memory as it is subject to such distortion. This concept is illustrated through a longitudinal study by Bartlett.

He aimed at seeing how much the memory of a story is affected by cultural background and unfamiliarity with the text. He wanted to see if cultural schemas affected memory so he told the native American tale, 'The war of the ghosts' to British participants unfamiliar with the names or style of the tale. He <sup>randomly</sup> divided the participants into two groups - ~~the~~ repeated

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reproduction ~~of~~ and serial reproduction.  
Repeated reproduction referred to hearing the story and repeating it after a few days, ~~or~~ weeks, months and years. Serial reproduction referred to ~~repeating the~~ just hearing and repeating the story to someone.

The results showed three major factors in both groups. Firstly, the Britishers attempted to make ~~to~~ the study consistent and coherent ~~with~~ with their culture to create meaning. This ~~lead~~ to ~~distortions~~ next, they shortened the story to 180 words and excluded information that was not relevant to their ~~or~~ cultural understanding. Lastly they changed the names ~~of~~, words, order of events and style of the story to suit their culture. For example, they used the word 'boat' instead of 'canoe'.

In the conclusion, this study has a clear link to the theory of reconstructive memory as the social schemas of the participants are linked ~~to~~ to their own ~~to~~ cultural schemas of British. Therefore, their memory is distorted to create meaning.

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in order to remember it and reproduce the story.

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Culture refers to the ideas, concepts and values of a social group of people. Cultural norms are a set of rules that you ought to follow to be accepted in the group. If you do not do so, you could be marginalised or seen as making positive change. Surface culture refers to the culture we see easily when we

interact with people from a group. Deep culture refers to the attitudes, values and beliefs of a group that are not easily seen.

Cultural dimensions refer to values of a culture affecting the behaviour of individuals.

An example is individualism which is the 'I' orientation.

It stresses on self-respect, independence, self-actualisation which is

one's motive to reach one's potential. On the

other hand, collectivism is the 'we' orientation that stresses on harmony,

authority, modesty, etc. It discourages dependence etc. It discourages self-empowerment. These

dimensions affect cognition and how our flashbulb memories are formed.

Flashbulb memories are emotional memories made

at one occasion and stored for a lifetime

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due to the high personal-relevance.

Kulkofsky studied 274 middle class adults from 5 countries - UK, US, Germany, Turkey and China with the aim to see the <sup>rate of</sup> formation of flashbulb memories in individualistic and collectivistic cultures.

They were given 5 minutes to think about public events in the past years. Using the memory questionnaire by 'Brown and Kulik',

Kulkofsky asked them who they were with when the event occurred, how they found out, what were they doing, when it was and where they were. These were followed by questions about how nationally or personally important the events were, how surprising they were and how often they spoke about it. These questions were translated to Mandarin Chinese, German, and Turkish languages and then back translated to English to remove ~~the~~ language as a possible confounding variable.

The results showed that collectivistic cultures showed a lower rate of formation of flashbulb memory as ~~was~~ emotional importance of events was not stressed in China. However, in individualistic cultures like the US, there was a high rate of formation of flashbulb memories. These were regarding personal memories. Surprisingly, the researchers found an equal rate of formation of flashbulb memories related to national events across

of all cultures.

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Through this study, it can be seen that cultural dimensions like individualism and collectivism play a big role in ~~mediates~~ the ~~is~~ deep and surface culture of countries. ~~As this case the deep culture.~~

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4

Animal models refer to animal research done to prove cause-effect hypotheses about human behaviour. This is conducted as humans and animals have similar genetic make-up. One example of the model could be a stress model in which research of the behaviour, 'stress' is conducted and then generalised to human behaviour. However, there are certain ethical considerations and implications of animal research. Ethics refers to the rules and conduct that must be followed by the researcher in order to not physically or psychologically cause harm to the participant, in this case the animal. A limitation here is that animals are caused undue stress or harm and do not have the right to withdraw. To ensure animals are safeguarded ethical considerations like cost-benefit analysis, refinement, replacement and reduction of the number of animals used could be made. Not letting laboratory animals into the wild is a must. For ~~a study~~ research, the correct animal should be chosen and should be treated in a humane manner.

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The ethics committee should also be consulted before carrying ~~out~~ on.

A study by Meaney illustrates the ethics followed and not considered by researchers. Meaney studied the effect of cortisol, a stress hormone on rats. Hormones are chemical secretions from endocrine glands that have medium-long term effects on the body. The endocrine system is more elaborate than the nervous system though they are interdependent. Hormones lead to largely involuntary changes like growth. This is the affect brain structure and prove the assumption of the biological approach to behaviour = behaviour is a product of brain structure. Hormones have an indirect effect on the brain as they only increase the probability of a certain behaviour. They influence target cells and ~~then~~ bind to their receptor sites creating gene activation or gene suppression. In this case, cortisol is a glucocorticoid or a stress hormone released by the cortex of an adrenal gland. It is a steroid and affects stress and memory.

Meaney's aim was to see the effect of glucocorticoids on stress. He used an independent samples design and randomly allocated rats into two groups - the treatment group and the control group. The treatment group was the experimental condition in which rats were taken from their mothers from

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for 15 mins everyday from the day of their birth to the day of weaning they were placed in a plastic container wrapped in white paper. After this, they were groomed by the researchers for 15 mins to simulate the mother's grooming in the control condition. There was no grooming. Then, the two-year old ~~to obtain long term test~~ rats were put to the test. They were placed in a pool of milky water with a platform. The researcher then tracked their routes according to ~~their~~ ~~measures of~~ ~~to~~ the rats' memories of how to get onto the platform. It was seen that the ones who were not groomed had more circuitous routes compared to the ones who were groomed.

After the rats were killed, it was seen that there was significant hippocampal cell loss, spatial memory deficits and cognitive impairments in the non-brushed rats. Hence the independent variable of the study is the group the rat was in and the dependent variable is the hippocampal cell loss.

~~which corresponds to low of acetylcholine~~  
 It was seen that in the short term, <sup>high</sup> cortisol levels corresponded to low stress levels. However, over time high cortisol levels lead to hippocampal cell loss. Due to the high low ecological validity of this laboratory experiment, results could be artificial. They ~~may~~ may not be able to be generalised to humans or real life. ~~Due to this~~ This

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quantitative research method, experiment, ~~may~~<sup>does</sup> not consider qualitative factors like the reason for stress of the rats. It would be the role of epigenetics in the study. Epigenetics refers to gene expression due to the environment ~~and~~ and experience of participant. In this case, the rat had a stressful environment which could have led to gene activation. ~~Lasty~~, undue stress and harm is caused to the rats as ~~both~~ they are killed in order for their brains to be studied. The right to withdraw is not given to these rats. The hippocampal cell loss is an irreversible change ~~and~~ and would have had a permanent impact ~~of~~ on the rat even if it were. This raises multiple ethical considerations discussed later.

Another study on rats ~~is~~<sup>is</sup> by Rodgers and Kesner. It is on neurotransmission which is the transmission of chemical messages through chemical substances called neurotransmitters that mediate events at the synapse on a neuron. The one released by neurons into the axon and they bind to receptors on dendrites of other neurons to pass nerve impulses. ~~Excitatory state~~ is when it ~~to~~ allows the ~~impulse~~ to pass and inhibitory state is when it doesn't. Agonists amplify neurotransmitters while antagonists don't. In this case the aim of the experiment is to see the effect of acetylcholine of memory retrieval,

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memory formation and retrieval. Rodgers and Kesner randomly allocated 30 rats into two groups the experimental condition and the control condition. In the experimental condition scopolamine, <sup>betablocker and</sup> an antagonist for acetylcholine, was injected into the hippocampus of rats. In the control group, a saline solution was used. ~~so~~ in order

to remove effects of the injection and any possible secretion of adrenaline. 30 rats acclimated in a Hebb's Williams maze with ~~had~~ food. ~~after~~ they were first given time to get used to the environment before the injection.

- It was seen that the the average numbers of errors between the first 5 trials of day one and the last 5 trials for day one were higher for the experimental group, proving the encoding of memory is affected by acetylcholine. However, retrieval was not affected as the errors of the last 5 trials of day 1 and first 5 trials of Day 2 were the same for both groups.

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In both studies, rats are used as they have a 99% genetic similarity to humans so the findings can be partially generalised. However, significant harm is caused to these rats. Therefore, a cost benefit analysis should be carried out keeping in mind that 'refinement' is necessary. This means that the best

animal for the study should be chosen and less numbers of those should be researched. Human pain and animal pain should be deemed the same. Replacing real animals with cell products or computer simulations is helpful. \*

In conclusion, in animal research ethics should be given ~~importance~~ a lot of importance to protect the field of psychology as well as any potential harm towards animals who do not have the right to withdraw from experiments they are forced into.

\* Researchers should be aware of rats' normal characteristics to know when they are stressed.

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