

PREVIEW

Themantic Education's

IB Psychology



SAQs and Review

Revision help for the “additional terms”

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Overview

PAPER ONE, PART A: SAQs “Additional Terms”

Every short answer response should have one central argument (explanation of the topic in the question) and one supporting study

	Content	SAQ Only Term	Example	Study
Biological Approach	Neuroplasticity	Neural network	Serotonin and PFC-Amygdala Connectivity	Passamonti et al. (2012)
		Neural pruning	Stress and neural pruning during adolescence	Luby et al. (2013)
		Neuron	Neuroplasticity in rats	Rosenzweig and Bennet (1960s)
	Neurotransmitters	Synapse: Excitatory neurotransmitters	Glutamate (in Ketamine)	Feder et al. (2014)
		Synapse: Inhibitory neurotransmitters	Serotonin	Passamonti et al. (2012)
		Agonist	Serotonin as a 5HT receptor agonist	Passamonti et al. (2012)
		Antagonist	Ketamine and PTSD	Feder et al. (2014)
	Genetic similarities	Twin and kinship studies	Genes and criminality	Christiansen (1977)
Cognitive Approach	Models of Memory	Multi-store model	Atkinson and Shiffrin's MSM	Peterson and Peterson (1959)
		Working memory model	Baddeley and Hitch's WMM	Robbins et al. (1996)
	Schema theory	Cognitive schema	Prior knowledge	Bransford and Johnson
	Models of Memory	Rational (controlled) thinking	System Two	Kahneman and Tversky (1974)
		Intuitive (automatic) thinking	System One & Anchoring Bias	Strack and Mussweiler (1997)
Sociocultural Approach	Social identity theory	Social groups	In-groups/Out-groups	Park and Rothbart (1982)
	Cultural influences	Cultural groups	Conformity in collectivist cultures	Berry (1967)
	Enculturation	Norms	Parenting and delayed gratification	Lamm et al. (2018)
	Acculturation	Assimilation/assimilate	Assimilation and depression	Morawa and Erim (2014)

Some “new” studies have been added to this resource. However, the “Exam Tips” shows you how you don’t have to use these new studies but can use those already in the [Student’s Guide](#) textbook and the [Revision Guide](#) textbook. Write a review of this product on [our store](#) and you can also get the [cheat sheet](#) for these terms.



How to Answer Any SAQ

The following 7 steps can be taken in order to create excellent SAQs.

1. Restate the question

Get straight to the point by restating the question and showing the specific examples you will use.

2. State the study

By following steps 1 and 2 you are simply doing what any good introduction does – telling the reader what to expect (i.e. providing context for the answer).

3. Definition

Defining the key term in the question is a good opening to a central argument and shows your knowledge. For example, if asked about neurotransmission then define neurotransmission. If you're asked about a research method, define the specific method you're writing about.

4. Central argument

All SAQs must have a central argument that both answers the question and shows you understand the topic. A major mistake students make in SAQs is focusing *only* on the study and completely forgetting about explaining the topic.

5. Describe the study

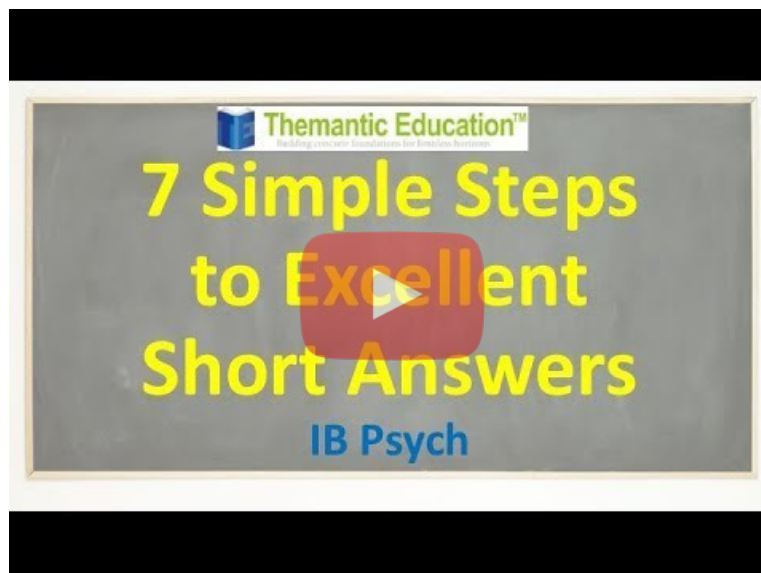
Describe the methods and results of the study. The more detailed the better, especially when it comes to the results.

6. Link the study

It is imperative that a summary of a study does not end with the results but goes further and links the study back to the question. For example, if using Loftus and Palmer in an SAQ about reconstructive memory it can't just end with the speed estimates and the % of participants who saw broken glass, but the answer must go further and explain how these results show that memory is reconstructive in nature.

7. Conclusion (optional)

This could simply be a one sentence statement that neatly restates the central idea of the answer, but it's not needed.



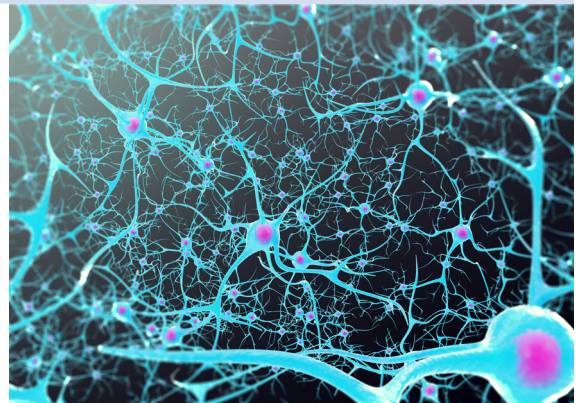
Neural Network

PFC-Amygdala

How can neural networks change?

Key Term Definition

Neural network: A neural network is a series of connected neurons that allows the processing and transmitting of information. Specific networks are responsible for specific tasks.



Key Details

- “The development of neural networks through repetition and neural pruning is both genetic and subject to environmental influences.” (IB Psychology Guide, pg. 24).
- **Serotonin** is a neurotransmitter that helps to form neural networks. This process begins in the womb and continues throughout our lives.
- Because serotonin helps form neural networks, reduced serotonin could cause a disruption to these networks and could lead to less connectivity between areas of the brain.
- An example of this is the **amygdala-PFC neural network**. Our amygdala generates emotions (especially negative ones like fear and anger). Our prefrontal cortex (PFC) can help control our emotions.
- If serotonin levels are low, the PFC might not be able to control the negative emotions in the amygdala. This could lead to outbursts of anger and **aggression**.

Key Study

Serotonin and the PFC-Amygdala Network (Passamonti et al. 2012): The aim of this study was to see what effect reduced serotonin has on the prefrontal cortex (PFC) when exposed to threat. Participants consumed a placebo drink or one lacking tryptophan (a key amino acid in the building of serotonin in the brain) which reduced serotonin levels. They were placed in an fMRI machine and were shown a variety of different faces (e.g. angry, happy, sad). Participants who drank the serotonin-depleting drink had reduced function in their PFC when they were perceiving images of angry faces while in the fMRI. The results also showed that reduced serotonin disrupted the neural network communication between the amygdala and the PFC when viewing angry faces. The reduced function in the PFC when exposed to angry faces (a threat) could explain serotonin’s link with aggression – people can’t inhibit their impulsive reaction to the threat because serotonin is affecting the part of the brain that helps us to stop acting impulsively.

This study shows how serotonin is important in neural networks between the amygdala and PFC.

Exam Tips

- If you’re interested in a study that shows how neural networks form when you’re a teenager, you can read about Squelia’s study ([link](#)). This shows how neural pruning strengthens the neural networks associated with cognitive tasks.
- Passamonti’s study can be used for multiple topics in the course. Finding overlaps like this is the key to managing your revision workload.



Neural Networks

SAQ #1 Serotonin and Neural Networks

Explain neural networks using one study to support your answer.

Serotonin is a neurotransmitter that helps with the formation of neural networks. Passamonti's study shows how reducing serotonin can affect neural networks between the prefrontal cortex (PFC) and the amygdala.

A neural network is a series of connected neurons that allows the processing and transmitting of information. Specific networks are responsible for specific tasks. Neural networks can happen naturally in the brain and they are also the result of lots of practice and repetition. When we learn something new, we're forming new neural networks.

Serotonin is a neurotransmitter that helps to form neural networks. Because serotonin helps form neural networks, reduced serotonin could cause a disruption to these networks and could lead to less connectivity between areas of the brain. An example of this is the amygdala-PFC neural network.

In Passamonti's study they show the effects of serotonin neural networks between the PFC and amygdala. Participants consumed a placebo drink or one lacking tryptophan (a key amino acid in the building of serotonin in the brain) which reduced serotonin levels. They were placed in an fMRI machine and were shown a variety of different faces (e.g. angry, happy, sad).

The results showed that reduced serotonin disrupted the neural network communication between the amygdala and the PFC when viewing angry faces. There was less connection between these two areas of the brain.

Our amygdala generates emotions (especially negative ones like fear and anger). Our prefrontal cortex (PFC) can help control our emotions. If serotonin levels are low, the PFC might not be able to control the negative emotions in the amygdala because the neural network is disrupted. This could lead to outbursts of anger and aggression and explains why serotonin is linked with aggression in many studies. (Approx. 290 words)

Comments

When using a study like Passamonti's that is relevant for many topics, it's important that you can explain exactly how it's relevant to the specific question you're using it to answer.

At the very least, you should be able to define the additional key terms. Use flashcards to help you.

I have probably used the term "neural network" too much in this answer, but it's better to use the key term too much rather than too little.

Some results are missing but that's OK because the most relevant ones are included.

I recommend having an in-depth knowledge of a few topics like serotonin and this study, rather than trying to remember lots of different examples.

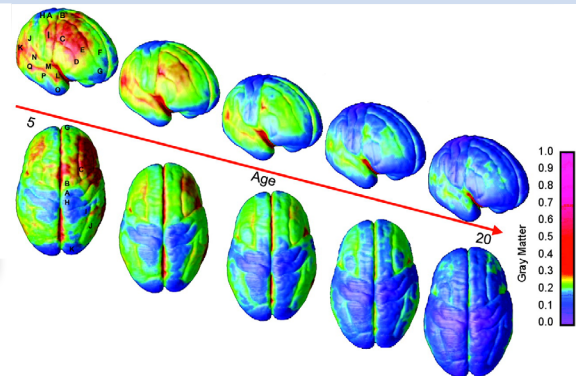
Neural Pruning

Stress and Neural Pruning

How does neural pruning happen?

Key Term Definition

Neural pruning: Neural pruning (aka Synaptic pruning) happens when we lose synaptic connections in a neural network because we do not use them.



Key Details

- Neurons send signals along the brain through neural networks. Networks are formed by the dendrites of one neuron connecting with another. The two dendrites don't fully touch and the small space between is called the "synapse." This is where neurotransmitters are fired from one neuron to the other.
- Neural pruning is when we lose these synaptic connections. This pruning happens a lot when you're a teenager. This is a healthy adaptation – your brain loses lots of neural networks that are infrequently used so it can have stronger connections between the networks that are used more frequently.
- But stress may accelerate neural pruning during adolescence. This could explain links between people who have high levels of stress and reduced brain development.

Key Study

Poverty and brain development (Luby et al., 2013) The aim of this study was to see if poverty was correlated with brain development and to see if there were mediating variables related to stress and parenting that could explain this relationship. MRIs were used to measure whether poverty, stressful events and parenting styles were correlated with hippocampal volume in 145 children over a 10-year period. The results showed a negative correlation between poverty and hippocampal volume. They also found that parenting and stressful life events were mediating variables in this relationship. This suggests that poverty, parenting styles and stressful life events are all factors that can negatively affect the development of neural networks in the hippocampus.

This study shows that stressful events could be accelerating the neural pruning process.

Exam Tips

- Squelia's study ([link](#)) shows how neural pruning strengthens the neural networks associated with cognitive tasks.
- Luby and/or Squelia's studies could be used for questions on neural pruning specifically or neuroplasticity more generally.

Image Source: The above image sequence "...was constructed from 52 MRI scans from 13 subjects who were scanned every 2 years during a 10-year period from ages 4 to 21 years. Red indicates more gray matter; blue, less gray matter. Gray matter (reduces) as the brain matures and neural connections are pruned." Image reprinted with permission from the National Academy of Sciences Copyright (2004) National Academy of Sciences, U.S.A. From Gogtay, N., Giedd, J., Lusk, L., Hayashi, K., Greenstein, D., & Vaituzis, A. et al. (2004). Dynamic mapping of human cortical development during childhood through early adulthood. *Proceedings Of The National Academy Of Sciences*, 101(21), 8174-8179. doi: 10.1073/pnas.0402680101.



Neural Pruning

SAQ #2: Stress and Neural Pruning

Explain neural pruning using one study to support your answer. Comments

Neural pruning happens a lot during our teenager years and it could be accelerated through stress. This can be shown in Luby et al.'s study.

Neural pruning (aka synaptic pruning) happens when we lose synaptic connections in a neural network because we do not use them. When we learn something new our brain adapts by developing new synaptic connections. The more we do something the more developed these connections (networks) become. If we don't use these networks, we lose synaptic connections. Neural pruning also happens a lot during adolescence. This is healthy because the pruning of unused connections helps to strength the networks of more frequently used synapses. But studies have shown stress could accelerate this pruning process. This could be why studies like Luby et al. show links between stress and lower brain development in kids.

In Luby et al.'s study, they studied the relationship between poverty, stress and brain development. MRIs were used to measure whether poverty, stressful events and parenting styles were correlated with hippocampal volume in 145 children over a 10-year period.

The results showed a negative correlation between poverty and hippocampal volume – higher rates of poverty, lower volume in the hippocampus. They also found that parenting and stressful life events were mediating variables in this relationship.

This means that stress and parenting explains why poverty was linked to the hippocampus. This study shows that stressful events could be accelerating the neural pruning process in kids. (Approx. 250 words).

An easier way to begin these SAQs could be to define the key term. But I like to keep a consistent format so it's easier to remember all the 7 steps in good SAQs.

It's difficult to predict the questions that will be asked about these additional terms because the guide doesn't give many details. This is why the most important thin is that you can give good definitions of the key term.

As long as it's true, it's a good thing to say "studies show..." to support claims you are making in your answers.

The most probable question is "Explain one study related to...(insert key term)." Therefore, make sure you can explain really clearly how one study is related to each term.