

AQA Psychology A-level

Topic 6: Biopsychology Essay Plans

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Question : Outline and evaluate the effect of endogenous pacemakers & exogenous zeitgebers on the sleep wake cycle (16 marks).

<p>AO1</p>	<ul style="list-style-type: none"> • Describe the difference between exogenous zeitgebers (external changes to the environment) & endogenous pacemakers (internal body clocks). • For endogenous pacemakers- it is the suprachiasmatic nucleus (SCN) which affects the sleep/wake cycle- describe this and how. • For exogenous zeitgebers- it is light that has an effect on sleep/wake cycle.
<p>AO3</p>	<ol style="list-style-type: none"> 1. Research support for the effect of the SCN on sleep/wake cycles- Decoursey et al (2000) destroyed SCN cells in 30 chipmunks and this results in their sleep/wake cycle disappearing. Could also include Ralph et al's study where mutant hamsters with 20-hour cycles were bred and when their SCN cells were transplanted into normal hamsters, their cycles altered. 2. However, a limitation is that SCN research obscures other body clocks in our bodies. There are many organs which have body clocks known as peripheral oscillators which have an effect on the sleep/wake cycle. 3. There is support for the effect of light on sleep/wake cycle- Siffre's study. Siffre in 1962 did a study where he entered a cave and had no natural light. He entered the cave in mid July and came out in mid September but thought it was mid August. This shows that light helps maintain our 24 hour circadian rhythms. 4. Although, a limitation of studies which investigate the exogenous zeitgeber of light is that they present the confounding variable of artificial light. As this variable is not controlled this casts doubt on the validity of the results from these studies. 5. Research is limited by always thinking of endogenous pacemakers and exogenous zeitgebers as separate. Perhaps their effects should be thought of as combined hence studied holistically.



Question : Outline and evaluate two or more ways of studying the brain (16 marks).

<p>A01</p>	<ul style="list-style-type: none"> • Functional magnetic resonance imaging (fMRI) is one way which involves measuring brain activity by detecting changes in blood oxygenation. • Electroencephalogram (EEG) involves recording changes in electrical activity of the brain by using electrodes attached to the scalp.
<p>A03</p>	<ol style="list-style-type: none"> 1. Possible strengths of fMRI- non-invasive, high spatial resolution, is able to image brain in action. 2. Limitations of fMRI- Not a direct measure so is not a truly quantitative measure, poor temporal resolution- 5 sec lag, expensive. 3. Strengths of EEG- used for clinical diagnosis for conditions such as tumours, epilepsy, high temporal resolution- a single millisecond, non-invasive. 4. Limitations of EEG- poor at measuring activity in deeper regions of the brain e.g. hippocampus, it is difficult to pinpoint the exact source of the activity as several electrodes pick up the same electrical activity. 5. Can compare to other ways of investigating the brain like event-related potentials and post-mortem examinations.



Outline and evaluate localisation of function in the brain (16 marks).

A01	<ul style="list-style-type: none"> • Localisation of function describes the theory that different areas of the brain are responsible for different specific behaviours or activities. • Can give examples of these different areas and their jobs- motor area, somatosensory area, visual area, auditory area. • Can also describe the functions of broca's area and wernicke's area which are only located in the left hemisphere. • The opposing theory is the holistic theory which instead states that all parts of the brain are involved and work together in processing thoughts and actions.
A03	<ol style="list-style-type: none"> 1. There have been gender differences found within research of cortical specialisation. Harasty et al (1997) found that women have larger Broca's and Wernicke's areas than men. This difference makes it difficult to map specific areas. 2. There is research support for localization of brain function from unique case studies. One example is of Phineas Gage (1848) who had an accident where an iron rod blasted through his frontal lobe. After this accident, a change in his personality was seen which suggests that the frontal lobe is in charge of mood regulation. 3. However on the other hand there has been evidence against localisation of brain function. Lashley (1950) removed areas of cortex in rats that were learning a maze and found that this had no effect on their progress. This suggests that for more complex cognitive functions the whole brain is involved. 4. Moreover plasticity provides an argument against localisation. Equipotentiality takes place in patients that have been subject to brain injury which is when the brain reorganises itself after damage to recover lost function in a different part of the brain to the one that was damaged. If localisation was the case for each behaviour that we carry out, this plasticity should not be possible.



Question : Describe and evaluate the fight or flight response (16 marks).

<p>A01</p>	<ul style="list-style-type: none"> • Describe what the fight or flight response (FFR) is- a collection of quick physical reactions to situations which are stressful. • The endocrine system works together with the autonomic system to bring about the FFR. • Describe the FFR process in the stages and describe the physiological changes it brings e.g. increase in heart rate and breathing rate, glucose release e.t.c.
<p>A03</p>	<ol style="list-style-type: none"> 1. Research suggests it suffers from beta bias, the FFR does not apply to women too. Taylor et al (2000) did research that found that women in stressful times protect themselves by caring and nurturing for their young (tending) or by forming alliances with others (befriending). 2. Moreover, there have been differences found between the genes of males and females which could explain why the FFR only applies to males. Lee and Harley (2012) did research which showed that the SRY gene found on the male Y chromosome is what is responsible for the FFR during stressful times. This SRY gene is absent in females. 3. The FFR has a negative impact on health in these modern times. The FFR has been seen to be adaptive for the stressful situations of the past that required energetic responses such as encountering animal predators. However for modern day stressors e.g. exam stress these energetic responses are not required. Modern day stressors tend to repeatedly activate the FFR which can result in serious health conditions e.g. increased blood pressure leading to heart disease. 4. Lastly the FFR has been criticised for being incomplete. Gray (1988) proposes that animals also 'freeze' before fleeing or fighting so as to gather information on what is the best reaction to the situation whilst they are hyper-vigilant.



Question : Discuss what research has told us about circadian rhythms (16 marks).

A01	<ul style="list-style-type: none"> • Circadian rhythms are a type of biological rhythm subject to a 24-hr cycle which regulates a number of body processes e.g. the sleep/wake cycle and changes in body temperature. • Then give examples of what research has shown us about the sleep/wake cycle e.g. Siffre's cave study (1962), Aschoff & Weaver (1976), Folkard et al (1985). • Then you can give examples of studies that have researched into changes in body temperatures e.g. Folkard et al (1977), Gupta (1991).
A03	<ol style="list-style-type: none"> 1. Understanding circadian rhythms has had practical application to shift work. It has shown that desynchronisation can lead to serious consequences. For example night shift workers have a period of reduced concentration at 6 am which means accidents may be more likely at this time. Therefore research into sleep/wake cycles can help the economy in terms of how to better manage worker productivity. 2. A limitation for research into circadian rhythms is that there are methodological issues presented. In Aschoff's and Siffre's study, small groups were used which raises the question whether the result can really be generalised to larger populations of people. 3. Moreover poor control meant that another confounding variable was presented in the studies- artificial light. Czeisler et al (1999) did a study which showed that circadian rhythms can be adjusted by dim lighting. This suggests that having artificial lighting in Siffre's and Aschoff's studies presented reason to doubt the internal validity of their results. 4. Lastly, there are individual differences that need to be accounted for when looking into circadian rhythms. Czeisler et al (1999) found that sleep/wake cycles vary between individuals from 13 to 65 hours. Duffy et al (2001) showed that some people prefer to sleep early and rise early (such people are known as 'larks') whilst others prefer to do the opposite ('owls'). Due to these individual differences, it is difficult to effectively generalise the findings from research done into circadian rhythms.

