

ASSESSMENT CHECK 21:

6.1–6.4 Biopsychology – The influence of biological structures on behaviour & The structure and function of sensory, relay and motor neurons & The influence of neurochemistry on behaviour & The fight-or-flight response (page 234)

- 1 Neurons are an essential part of a mass communication system within the body. The function of neurons within this system is to receive and transmit information.
- 2 Synaptic transmission is the process by which messages are relayed from neuron to neuron. This process involves nerve impulses being sent over the small gap between neurons known as the synapse. Nerve impulses are electrical signals that are carried by chemicals called neurotransmitters. These chemicals are released into the synaptic fluid in the synapse from the pre-synaptic terminal. The next neuron receives these chemicals and converts them into an electrical impulse, so that the process can be repeated.
- 3 Sensory neuron = B
 Motor neuron = A
 Relay neuron = D
- 4 The endocrine system consists of a series of glands that release chemicals called hormones throughout the body in blood and other bodily fluids. This allows the communication of messages between bodily organs. For example, following orgasm the pituitary gland triggers the release of the hormone oxytocin into the bloodstream, which aids conception as well as producing feelings of calm and relaxation.
- 5 While Paul waits for a rollercoaster ride, the fear he experiences is detected by the hypothalamus brain area, which signals the adrenal medulla within the adrenal gland to trigger the release of the hormone adrenaline into the bloodstream. This prompts increased heart rate, increased breathing rate and sweating (indicated by Paul sweating while in the queue) and reduced functioning of the digestive (indicated by his dry mouth) and immune systems. This activates the bodily response of fight-or-flight, which occurs during fearful situations.
- 6 ‘Discuss’ means to outline and evaluate, in this instance the influence of biological structures on behaviour.

There are 6 marks available here for outlining the influence of biological structures on behaviour and 10 marks available for the evaluation of them. About 20 minutes should be spent constructing the answer, of which about 7½ minutes should be

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spent on the outline and 12½ minutes on the evaluation. For the average student this equates to about 150 to 185 words for the outlining and 250 to 310 words for the evaluation.

One way to construct an answer would be firstly to outline the influence of one type of biological structure and evaluate it, then to repeat the process in turn for other biological structures. An alternative way would be to outline the overall influence of biological structures on behaviour in general and then to provide an overall evaluation of these.

The outline should focus on describing how biological structures influence behaviour. Marks awarded would depend on the accuracy, relevance and clarity of the descriptions and the degree of elaboration (detail). For instance, by providing descriptive detail of the workings of the nervous system, neurochemistry and the fight-or-flight response.

Evaluation would probably best be achieved by detailing what research evidence has found about biological processes and their influence on behaviour. Yamamoto & Kitazawa's (2001) study of the perception of touch would be useful here, as would Kosfeld's (2005) study of the influence of oxytocin.

Evaluation based on practical applications could assess whether the knowledge gained about biological processes lends itself to practical applications, like effective drug therapies.

Evaluative material focused on methodological and ethical criticisms, such as the ethical issue of harm when researching on animals as an alternative to humans, would be relevant only if focused on the validity of biological structures in explaining behaviour.

It should be remembered that the most effective evaluation is created from a number of evaluative points being woven together to form a sophisticated commentary, rather than being a series of unconnected evaluative points.

- 7 Research on biological structures is argued to be reliable as it produces consistent results, whether by the same or different researchers. The results can also be argued to be internally reliable as they are objective and not subjective.
- 8 There are 6 marks available here for outlining the role of biological structures in explaining human behaviour and 6 marks available for the evaluation of them. About 15 minutes should be spent constructing the answer, of which about 7½ minutes should be spent on the outline and 7½ minutes on the evaluation. For the average student this equates to about 150 to 185 words for the outlining and similar for the evaluation.

One way to construct an answer would be firstly to outline the influence of one type of biological structure and evaluate it, then to repeat the process in turn for other biological structures. An alternative way would be to outline the overall influence of biological structures on behaviour in general and then to provide an overall evaluation of these.

The outline should focus on describing how biological structures influence behaviour. Marks awarded would depend on the accuracy, relevance and clarity of the descriptions and the degree of elaboration (detail). For instance, by providing descriptive detail of the workings of the nervous system, neurochemistry and the fight-or-flight response.

Evaluation would probably best be achieved by detailing what research evidence has found about biological processes and their influence on behaviour. Yamamoto & Kitazawa's (2001) study of the perception of touch would be useful here, as would Kosfeld's (2005) study of the influence of oxytocin.

Evaluation based on practical applications could assess whether the knowledge gained about biological processes lends itself to practical applications, like effective drug therapies.

Evaluative material focused on methodological and ethical criticisms, such as the ethical issue of harm when researching on animals as an alternative to humans, would be relevant only if focused on the validity of biological processes in explaining behaviour.

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ASSESSMENT CHECK 22:

6.5 Biopsychology – Localisation of function in the brain (page 246)

- 1 If a function of the brain is dealt with by only one hemisphere of the brain, then it is said to be lateralised. For example, for most people language processing is dealt with by the left hemisphere; this is why people's language abilities may be affected if they have a stroke on the left side of their brain.
- 2 There are 6 marks available here for outlining split-brain research and 10 marks available for the evaluation. About 20 minutes should be spent constructing the answer, of which about 7½ minutes should be spent on the outline and 12½ minutes on the evaluation. For the average student this equates to about 150 to 185 words for the outlining and 250 to 310 words for the evaluation.

One way to construct an answer would be firstly to outline relevant research studies and then to provide an evaluation of them. An alternative way would be to outline an individual research study and evaluate it, then to repeat the process for other research studies.

Due to the wording of the question, it would also be possible to outline explanations (research) of split brains and then to evaluate these explanations in terms of what research studies suggest.

The outline would probably focus on describing research studies in terms of their aims, procedures and findings. Marks awarded would depend on the accuracy, relevance and clarity of the descriptions and the degree of elaboration (detail) provided about the studies. Relevant studies could include Sperry's (1968) study of the function of hemispheres in split-brain patients, as well as Franz *et al.*'s (2010) study of the processing of information in split-brain patients.

Evaluation could centre on methodological analyses of studies, for example that Sperry's sample was small, creating problems of generalisation, and that by generating qualitative as well as quantitative data the research increased its reliability as well as its validity. Ethical considerations would also be relevant, as well as conclusions drawn.

Additional evaluation could centre on practical applications, such as patients learning to compensate for the lack of connectivity of the two hemispheres by using strategies such as turning their heads so both hemispheres can take in the environment. Also more general evaluation, such as research contributing to an understanding of the role of each hemisphere.

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It should be remembered that the most effective evaluation is created from a number of evaluative points being woven together to form a sophisticated commentary, rather than being a series of unconnected evaluative points.

3 Motor cortex = D

Wernicke's area = C

Broca's area = B

4 It was found from split-brain research that unfamiliar functions (e.g. stringing beads on to a piece of string) can't be done, but that familiar functions (e.g. tying shoelaces) can be done.

Another finding was that for a few weeks after surgery to split the two hemispheres the hemispheres act separately, making a person feel that they are two people within one body.

5 Joanne's chances of recovery will be affected by her age; patients older than 40 years of age tend to regain less function than people under 40 years of age.

Her chances of recovery are quite good as she is female – research shows that women recover better than males from brain injuries, as their function is not as lateralised (concentrated in one hemisphere) as it is in males.

6 The conclusions may not be valid as the sample size, for both males and females, is so small, causing problems in being able to generalise findings to the target population. Internal validity (whether the results are due to the manipulation of the IV and not some other variable) is also reduced, as there are many other factors that could be involved, such as alcohol consumption, age, stress, etc.

ASSESSMENT CHECK 23:

6.6–6.7 Biopsychology – Ways of studying the brain & Biological rhythms (page 255)

- 1 An ultradian rhythm is a biological rhythm that occurs more than once a day, like the sleep–wake cycle; an infradian rhythm is a biological rhythm that occurs less than once a day, like the female menstrual cycle.
- 2 There are 6 marks available here for outlining research into circadian rhythms and 10 marks available for the evaluation. About 20 minutes should be spent constructing the answer, of which about 7½ minutes should be spent on the outline and 12½ minutes on the evaluation. For the average student this equates to about 150 to 185 words for the outlining and 250 to 310 words for the evaluation.

One way to construct an answer would be firstly to outline relevant research studies and then to provide an evaluation of them. An alternative way would be to outline an individual research study and evaluate it, then to repeat the process for other research studies.

Due to the wording of the question, it would also be possible to outline explanations (research) of circadian rhythms and then to evaluate these explanations in terms of what research studies suggest.

The outline would probably focus on describing research studies in terms of their aims, procedures and findings. Marks awarded would depend on the accuracy, relevance and clarity of the descriptions and the degree of elaboration (detail) provided about the studies. Relevant studies could include Siffre's (1975) study of a man isolated in a cave, as well as Aschoff & Weber's (1962) study of participants living in a bunker and Folkard's (1985) study of participants living without natural light.

Evaluation could centre on methodological analyses of studies, for example that sample sizes were small thus creating problems of generalisation. Ethical considerations would also be relevant, as well as conclusions drawn.

Additional evaluation could centre on practical applications, such as light therapy as a treatment for depression, as well as more general evaluation, such as research contributing to an understanding of the interaction between endogenous pacemakers and exogenous zeitgebers.

It should be remembered that the most effective evaluation is created from a number of evaluative points being woven together to form a sophisticated commentary, rather than being a series of unconnected evaluative points.

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- 3 Functional magnetic resonance imaging = C
Event-related potentials = D
Electroencephalograms = A
- 4 One example of an endogenous pacemaker would be the suprachiasmatic nucleus, which is found in the hypothalamus and acts as an internal body clock.

Another example would be the pineal gland, which contains light-sensitive cells and helps with the onset of sleep.
- 5 One issue with using post-mortem examinations to localise function in the brain is that the research is conducted on a dead person so there is no brain activity measured.

Another issue is with comparing function before death, as generally there will be no information on how an individual functioned before they died.
- 6 The data gathered may not reflect internal validity (whether it measures what it claims to measure), as the method used to measure brain activity (EEG) could affect sleep patterns. EEG involves having electrodes applied to the scalp, which might mean the participants being tested would not sleep as they normally would. Therefore, the sleep responses recorded may not be typical and thus may not be internally valid.