

Please write clearly in block capitals.

Centre number

--	--	--	--	--

Candidate number

--	--	--	--

Surname *StemUp Model Solution*

Forename(s)

Candidate signature

I declare this is my own work.

INTERNATIONAL AS PSYCHOLOGY

Unit 2 Biopsychology, Development and Research Methods 1

Friday 2 June 2023

07:00 GMT

Time allowed: 1 hour 30 minutes

Materials

For this paper you must have:

- a calculator, which you are expected to use where appropriate.

Instructions

- Use black ink or black ball-point pen.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- All working must be shown.
- If you need extra space for your answer(s), use the lined pages at the end of this book. Write the question number against your answer(s).
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 90.

For Examiner's Use	
Section	Mark
A	
B	
C	
TOTAL	



J U N 2 3 P S 0 2 0 1

Section A: BiopsychologyAnswer **all** questions in the spaces provided.Only **one** answer per question is allowed.

For each question completely fill in the circle alongside the appropriate answer.

CORRECT METHOD



WRONG METHODS



If you want to change your answer you must cross out your original answer as shown.



If you wish to return to an answer previously crossed out, ring the answer you now wish to select as shown.

**0 1**

Identify the division of the nervous system which is mostly associated with motor movements, such as running.

Shade **one** box only.**[1 mark]****A** Autonomous nervous system**B** Central nervous system**C** Peripheral nervous system**D** Somatic nervous system**0 2**

What is the function of neurotransmitters during synaptic transmission?

[2 marks]

They enable the nerve impulse to pass across the synapse from the presynaptic to the postsynaptic neuron. Excitatory ones make an action potential more likely in the postsynaptic neuron; inhibitory ones make it less likely.



0 3

Describe the structure **and** function of a relay neuron.

[4 marks]

Structure: a relay neuron has a central cell body containing a nucleus, with many short dendrites running in towards the cell body. It has a single short output axon and no myelin sheath.

Function: relay neurons are found only in the CNS (brain and spinal cord). They interconnect sensory and motor neurons, receiving electrical impulses from sensory neurons and conducting them on to motor neurons, e.g. in a reflex arc. They also interconnect different parts of the CNS, allowing neurons to communicate with each other.

0 4

Localisation of function in the brain suggests specific brain areas are specialised for certain functions.

Briefly explain the function of the auditory centre.

[2 marks]

The auditory centre, in the temporal lobe, is involved in hearing. It receives and processes sound input from the ears and analyses acoustic information, such as volume, tempo and pitch.

Turn over for the next question

Turn over ►



0 5

Amaan is waiting to be interviewed for a new job. He is very nervous. His heart is beating very fast. Amaan feels sick and his mouth is dry. His legs are shaking.

Describe the fight or flight response. Refer to Amaan's experience in your answer.

[9 marks]

The fight or flight response is an automatic reflex: the body's physiological reaction to a threatening or stressful situation. It is generated by the sympathetic branch of the autonomic nervous system (ANS) and allows the individual to react quickly so that they can either fight or escape the threat.

When a threat is perceived, the hypothalamus detects the situation as threatening and activates the sympathetic nervous system, so control switches from the parasympathetic to the sympathetic branch. The sympathetic nervous system sends a message to the adrenal medulla, which releases adrenaline into the bloodstream (endocrine system), and noradrenaline is released in the brain. This prompts physical changes to help the person deal with the threat or escape: increased heart rate and breathing rate, muscle tension, sweating, dilated pupils, reduced salivation and a reduction in digestion, so energy is directed to where it is needed.

Amaan is nervous because his hypothalamus detects the job interview as a threat, which activates the sympathetic nervous system and leads to the release of adrenaline from his adrenal medulla.

Amaan's heart is beating very fast because adrenaline increases his heart rate, which speeds up the flow of oxygenated blood and glucose to his muscles to prepare his body for fight or flight.

Amaan feels sick and his mouth is dry because of the increase in adrenaline: salivation is inhibited and digestion slows down, so that energy is saved for energy expenditure in fighting or running away.

His legs are shaking because blood flow is diverted to his skeletal



muscles and they are tense, ready to aid flight. Once the interview is over and the threat has passed, the parasympathetic nervous system will return his body to its normal resting state ('rest and digest').

Extra space

Turn over ►



0 6

Describe and evaluate research into plasticity **and** functional recovery after trauma.**[12 marks]**

Plasticity is the ability of the brain to change and adapt its structure and function as a result of experience, learning and trauma. Blakemore and Mitchell (1973) showed plasticity in the development of the visual cortex: kittens raised in an environment of only vertical stripes developed visual cortex neurons responsive mainly to vertical lines and were unable to see horizontal lines, showing that experience shapes the developing brain. Maguire (2000) used MRI scans and found that London taxi drivers had a larger posterior hippocampus than a control group, and the volume was positively correlated with time spent as a taxi driver, showing that the adult brain changes with extensive spatial navigation experience. Functional recovery is the recovery of abilities lost after brain damage caused by trauma, e.g. a stroke or injury. Undamaged areas of the brain can take over the functions of damaged areas. Mechanisms of recovery include a reduction of swelling of brain tissue, axonal sprouting (the growth of new nerve endings from surviving neurons to connect with other undamaged neurons), and neurogenesis, the growth of new neurons. Villablanca and Hovda (2000) found that when one damaged hemisphere was removed soon after birth (hemispherectomy), the remaining hemisphere could take over many of its functions. Kapur (1997) found that doctors had a better recovery after brain damage than the general population, suggesting that cognitive reserve aids recovery. Age also plays a role, as more significant change is possible in younger brains: Teuber (1975) found that soldiers under the age of 20 with brain injuries had a much better recovery of movement and visual problems than older soldiers.



A strength of this research is that it is supported by objective scientific evidence. Maguire used MRI brain scans to measure the size of the hippocampus, which is not open to bias from the researcher's interpretation, increasing the validity of the conclusion that the brain shows plasticity.

However, much of the research into functional recovery uses case studies or studies with small numbers of participants, e.g. hemispherectomy patients or brain-damaged soldiers. These individuals have unique types and degrees of brain damage, so it is difficult to generalise the results to the wider population. Also, Maguire's study is correlational, so it is possible that people with a larger hippocampus are more likely to become taxi drivers, rather than taxi driving causing the change.

Another limitation is that some research, such as Blakemore and Mitchell's study, used animals. Although this allows experience to be controlled in a way that would be unethical in humans, the brains of cats are less complex than human brains, so there are issues with generalising from animals to humans. The study also raises ethical issues, as the kittens experienced lasting harm.

A strength of the research is its real-life application. Knowledge about plasticity and functional recovery has raised awareness of the importance of rehabilitation, e.g. physiotherapy and speech therapy after a stroke, which encourages the brain to form new connections and so promotes recovery.

However, it is difficult to predict the level of recovery a person will make, so the research has low predictive validity. There are huge individual differences in recovery because many factors play a part, such

Turn over ►



Extra space *as age, educational level, determination, the amount of practice and the degree of damage. For example, Kapur's findings suggest that education level influences recovery, so it cannot simply be assumed that a younger brain will always recover better.*

Overall, there is strong evidence that the brain is plastic and can recover function after trauma, although the extent of recovery varies considerably between individuals.



Section B: Cognitive DevelopmentAnswer **all** questions in the spaces provided.**0 7**

What does Piaget mean by equilibration?

[4 marks]

Equilibration is the process in which a child achieves a cognitive balance (equilibrium) between new information and their old (existing) knowledge of the world.

When a new experience does not fit existing schemas, the child experiences disequilibrium. To overcome this, the child uses assimilation (fitting the new information into an existing schema) and accommodation (changing an existing schema or creating a new one) until a state of equilibrium is restored between their schemas and the new experience. For example, a child a new schema for a cat when it realises that a cat is not the same as a dog.

Equilibration drives cognitive development and helps explain how children are able to move from one stage of thought into the next.

Turn over for the next question**Turn over ►**

0 8

Mimi is three years old and is playing with her older sisters, Bex and Robyn. Robyn places her ball in a box and leaves the room. Bex takes the ball out of the box and hides it in a cupboard. When Robyn returns, she looks for her ball in the box and is very surprised when she cannot find it. Mimi laughs and asks, "Have you forgotten that your ball is in the cupboard?"

Using your knowledge of theory of mind, explain the behaviours of Mimi and Robyn.

[6 marks]

Robyn has acquired a theory of mind. She did not see Bex move the ball, so she still believes it is in the box. This is a false belief, so she looks in the box and is surprised.

Mimi, aged three, has not yet developed a theory of mind. She cannot take Robyn's perspective or understand Robyn's mental state: that Robyn has no knowledge of the ball's changed location. Mimi thinks Robyn will know what Mimi knows about where Bex moved the ball, so she expects Robyn to look in the cupboard. Her laughter and comment 'Have you forgotten that your ball is in the cupboard?' show that Mimi cannot attribute a false belief to Robyn. If she had understood Robyn's false belief, she would not have laughed at Robyn looking in the box.



0 9

Mona is teaching her younger brother Arno to count.

Pointing to Arno's toy cars, Mona says out loud the numbers one to five. Mona says to Arno, "Now, you have a go. Point with your finger at the cars." As Arno tries to count, Mona says, "Well done, Arno! Do it again." After his sister's help, Arno can now count to five easily.

Discuss Vygotsky's theory of cognitive development. Refer to Arno and Mona in your answer.

[20 marks]

Vygotsky's theory emphasises the role of social and cultural factors in cognitive development. He argued that children are born with elementary mental functions, such as attention and sensation, which are transformed into higher mental functions, such as problem solving and reasoning, through social interaction. Children learn the tools of their own culture, especially language, from the people around them, and internalise a world view of other people through social interaction.

Language plays a central role in thought. At first speech is social and is used to communicate with others. Children then use egocentric (private) speech, talking aloud to themselves to guide their actions. At around the age of seven to eight years, language becomes internalised and becomes intellectual (inner) speech, which is used for thinking.

A key concept is the zone of proximal development (ZPD): the difference between what a child can do on their own (actual ability) and what they can achieve with the help of a more knowledgeable other (MKO), such as a parent, teacher or older sibling (potential ability).

Learning takes place within the ZPD. The MKO provides scaffolding, which is support that is adjusted to the child's needs: tasks are broken down into smaller steps, the MKO demonstrates, gives instructions and encouragement, and gradually withdraws the help as the child becomes competent, until the child can complete the task independently. The

Turn over ►



child is therefore seen as an apprentice to a more knowledgeable other, and instruction plays an important role in development.

In the scenario, Mona is the more knowledgeable other because she knows how to count, and counting to five is within Arno's ZPD, as he cannot do it alone but can with help. Mona provides scaffolding by breaking down the skill of counting into a smaller element, counting only to five. She demonstrates counting directly by modelling it, pointing at the toy cars and saying the numbers out loud. She gives general encouragement by saying 'Now, you have a go' and 'Well done, Arno!', and specific instruction by telling Arno to point with his finger at the cars. With practice Arno learns to count, so Mona can provide less help until he is able to count to five independently, showing that his potential ability has become his actual ability.

There is research evidence to support the concept of scaffolding. Wood and Middleton (1975) observed mothers helping their four-year-old children to build a model from blocks. The most effective mothers adjusted their help to the child's performance, giving more specific instructions when the child struggled and less help when the child was succeeding. This supports Vygotsky's idea that learning is most effective when an MKO works within the child's ZPD. Greenfield and Lave (1982) observed Mexican girls learning to weave. Novice weavers received a great deal of help and direct instruction from experts, which was reduced as they became more skilled. This shows scaffolding occurs in another culture, increasing generalisability.

However, this research used observation, producing qualitative data that the researcher must interpret, so findings may be affected by observer



bias, and samples were small, limiting generalisation.

A strength of Vygotsky's theory is its practical application to education.

It has led to techniques such as peer tutoring, in which a more able

student helps a less able one, and guided learning, in which teachers

support children within their ZPD rather than waiting for them to

discover things alone. This shows the theory has useful real-world value.

However, guidance and instruction may not always have a positive

influence. Too much help from an MKO may reduce a child's motivation

and independence, as they may come to rely on others rather than

working things out themselves. If Mona continued to count for Arno, he

might not learn to count without her.

Vygotsky's theory can be contrasted with Piaget's theory. Piaget argued

that children learn through independent discovery and must be

biologically ready before they can move to the next stage. Unlike Piaget's

Extra space *notion of readiness, Vygotsky believed that development could*

be accelerated to some extent through the ZPD and collaborative learning

with an MKO. Vygotsky's theory also focuses on the process of cognitive

development rather than its outcomes, whereas Piaget described the

outcomes in the form of age-related stages. Vygotsky's theory is,

however, vague: concepts such as the ZPD are hard to measure precisely,

so the theory is difficult to test scientifically.

Overall, Vygotsky's theory provides a useful explanation of how social

interaction, language and culture drive cognitive development, supported

by observational research and with valuable applications, although it is

best seen as complementing biological and individual explanations such as

Piaget's.



Section C: Research Methods 1

Answer **all** questions in the spaces provided.

A teacher wanted to find out what techniques her students used when they revised for a test. She decided to collect primary data. After a lesson, she approached five students and asked if they would take part in a short interview.

She interviewed each of the students individually. At the start of each interview, she asked the student how they revised. Depending on their answer, she then thought of further questions to ask.

1	0
---	---

Identify the type of interview the teacher used. Briefly explain your answer.

[2 marks]

Unstructured interview.

The questions she asked were not determined beforehand: apart from asking how they revised, her further questions varied from interview to interview, depending on each student's answer.

1	1
---	---

Identify the sampling technique used by the teacher.

[1 mark]

Opportunity sampling.



1 2

Explain why there might be bias in the sample the teacher used.

[3 marks]

The teacher used opportunity sampling, approaching students available after a lesson, so she may have chosen a specific type of student, e.g. those she knows well or who seem keen. The sample was only five students, which is very small and lacks diversity, and they all came from the same school and class, so the sample is unlikely to be representative of students' revision techniques in general.

1 3

Briefly explain **two** limitations of using self-report techniques.

[4 marks]

Limitation 1 *Answers might be subject to social desirability bias: students may say they use the revision techniques they think the teacher wants to hear, rather than the truth, which reduces validity.*

Limitation 2 *Self-reports gather subjective information which is difficult to analyse objectively, so there is a risk of researcher bias, as the teacher must process and interpret the answers.*

1 4

Briefly explain why the data the teacher collected is primary data.

[2 marks]

It is primary data because the teacher collected it first hand, directly from the students in her own interviews, for the specific purpose of her study, so she can be sure the data is about their revision techniques.

Turn over ►

1	5
---	---

Students may have felt embarrassed and anxious when they were interviewed by their teacher.

Explain how the teacher could have made sure her students were protected from psychological harm during the interview.

[3 marks]

During the interview, the teacher should have reminded the students that participation is voluntary and that they have the right to withdraw at any time, without any effect on their grades. She should also have reminded them that their answers were confidential and that no names were being recorded. Another person could have conducted the interviews so answers stayed anonymous to her.

1	6
---	---

At the end of each interview, the teacher conducted a debrief with the student.

Explain what information the teacher should have provided in the debrief.

[3 marks]

She should have reminded the student of the aim of the interview, to investigate the revision techniques students use. She should have repeated that taking part was voluntary and that they were still able to withdraw their data. She should have reassured them that the interview was confidential, and offered access to help in case it brought up anything they wished to discuss.



1	7
---	---

In her interviews, the teacher collected qualitative data.

Outline **two** differences between qualitative and quantitative data.

[4 marks]

Difference 1 *Qualitative data is made up of words, e.g. descriptions of how students revise, while quantitative data is numerical, e.g. a frequency or score.*

Difference 2 *Qualitative data requires participants to express themselves in their own words, while quantitative data requires them to select an option provided by the researcher or to create a score.*

Turn over for the next question

Turn over ►



Follow-up study

In the interviews, most students mentioned using visual aids, such as posters. The teacher wanted to follow up her study into revision techniques. She decided to investigate how useful posters are when revising. Her class was due to take a psychology test. The teacher divided her class into two groups.

Group 1 was told to revise only by making posters.

Group 2 was told to use any revision technique apart from posters.

The students all completed the same psychology test. The test had a maximum score of 20 marks.

1 8

Identify the experimental design used by the teacher. Briefly justify your answer.

[2 marks]

Independent groups design.

Each student took part in only one condition: either the poster group or the other revision techniques group.

1 9

Identify the operationalised dependent variable in the follow-up study.

[2 marks]

The score each student achieved on the psychology test, out of a maximum of 20 marks.



2 0

Identify the type of experiment used by the teacher in the follow-up study.
Briefly justify your answer.

[2 marks]

Field experiment.

The students completed a psychology test that took place during their normal lesson, in their natural environment, but the teacher manipulated the IV (revision technique).

2 1

Identify **one** extraneous variable in the follow-up study and briefly explain how the teacher could have dealt with this.

[2 marks]

Student ability: some students might be better at psychology than others. The teacher could use a matched pairs design, matching students on their previous psychology test scores and putting one of each pair into each group.

30**END OF QUESTIONS**

There are no questions printed on this page

*Do not write
outside the
box*

**DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED**



[illegible]

There are no questions printed on this page

*Do not write
outside the
box*

**DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED**

Copyright information

For confidentiality purposes, all acknowledgements of third-party copyright material are published in a separate booklet. This booklet is published after each live examination series and is available for free download from www.oxfordaqaexams.org.uk.

Permission to reproduce all copyright material has been applied for. In some cases, efforts to contact copyright-holders may have been unsuccessful and Oxford International AQA Examinations will be happy to rectify any omissions of acknowledgements. If you have any queries please contact the Copyright Team.

Copyright © 2023 Oxford International AQA Examinations and its licensors. All rights reserved.



2 4



2 3 6 X P S 0 2