

Please write clearly in block capitals.

Centre number

Candidate number

Surname StemUp Model Solution

Forename(s) _____

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I declare this is my own work.

INTERNATIONAL A-LEVEL PSYCHOLOGY

Unit 3 Advanced Topics and Research Methods 2

Wednesday 14 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	



Section A: Psychology of SleepAnswer **all** questions in the spaces provided.**0 1**Briefly outline **one** characteristic of narcolepsy.**[2 marks]**

Cataplexy: a sudden and unexpected loss of muscle tone while the person is awake, often triggered by strong emotions such as laughter, so the person may collapse while fully conscious.

0 2

Briefly evaluate research into narcolepsy.

[4 marks]

Lin et al. (1999) found narcoleptic dogs had a mutated hypocretin (orexin) receptor gene, and Thannickal et al. (2000) found that human narcoleptics had about 90% fewer hypocretin neurons than controls, supporting a biological explanation. However, research into causes often uses dogs, so findings may not generalise to humans. Human studies are correlational, so hypocretin loss may not cause narcolepsy, a problem of internal validity. Teenage onset questions a genetic origin. The research is reductionist and determinist, implying patients have little control, but it is nomothetic, so it can lead to treatments for many sufferers.



0	3
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Two students are talking about animal behaviours.

“Animal sleeping habits are fascinating,” says Olga. “Bears sleep through the entire winter while other animals, like hamsters, sleep all day but are awake and active at night.”

“And I’ve always wondered why squirrels or cats may sleep up to 20 hours a day!” replies Anya.

Using your knowledge of **at least one** evolutionary explanation for the functions of sleep, explain the conversation between Olga and Anya.

[4 marks]

Sleep patterns are adaptive. Hibernation theory (energy conservation) explains why bears sleep through winter: food is scarce, so long sleep slows their metabolic rate to save energy. Hamsters are nocturnal because they adapted to be awake when it is safest and food is available: as prey they stay hidden in daylight and feed at night when predators are less active. Squirrels sleeping up to 20 hours stay hidden from predators like birds of prey, while cats, as predators, can afford long sleep to conserve energy between hunts.

Turn over for the next question

Turn over ►



0 4

Discuss the effects of endogenous pacemakers **and** exogenous zeitgebers on the sleep/wake cycle.

[20 marks]

Endogenous pacemakers (EPs) are internal biological clocks that control bodily rhythms. The main EP for the sleep/wake cycle is the suprachiasmatic nucleus (SCN), a cluster of nerve cells in the hypothalamus. The SCN receives information about light from the optic chiasm, even when the eyes are closed, and sends signals to the pineal gland. In darkness the pineal gland increases production of melatonin, which induces sleep, and in light melatonin secretion is inhibited, so we wake. At a molecular level, clock proteins such as PER and TIM build up and break down over roughly 24 hours, producing the rhythm.

Exogenous zeitgebers (EZs) are external, environmental cues that reset the biological clock. The most important is light, which resets the SCN via the retina and so adjusts melatonin release. Social cues, such as meal times and work schedules, also help, as do temperature and noise. The process by which EPs are reset each day by EZs so that the free-running rhythm of about 25 hours matches the 24-hour day is called entrainment.

Research supports the role of EPs. Siffre spent months in a cave with no natural light or clocks and found that his sleep/wake cycle free-ran at slightly longer than 24 hours (about 25 hours), showing the body has an internal clock but also needs EZs to keep it to 24 hours.

Morgan (1995) transplanted the SCN from mutant hamsters with 20-hour rhythms into normal hamsters, which then adopted the 20-hour rhythm, and Stephan and Zucker (1972) found rats with SCN lesions lost their sleep/wake rhythm. This shows the SCN is the main EP. However, these are animal studies, so generalising to humans is



questionable.

Research also supports the role of EZs. Campbell and Murphy (1998) shone light on the backs of participants' knees and shifted their sleep/wake cycle by up to three hours, suggesting light can reset the rhythm through routes other than the eyes. However, later studies failed to replicate this, which questions its reliability. Real-life examples such as jet lag and shift work show that when EZs conflict with the EP, the cycle is disrupted, giving the research high ecological validity and practical applications, eg using light exposure and melatonin to reduce jet lag or plan shift rotations.

There are methodological problems. Siffre's study was a case study of one person, so the findings may not generalise, and in early isolation studies participants had artificial light, which may itself have acted as an EZ, reducing validity. It is very difficult to separate EPs from EZs completely, as removing one EZ may leave others, such as temperature, acting on the cycle, so extraneous variables cannot be fully controlled. Nevertheless, both EPs and EZs are observable and measurable, eg melatonin levels and light exposure, so the concepts can be tested and falsified, which makes the research scientific with good internal validity. However, people living in the Arctic keep normal sleep patterns despite months of continuous daylight, so light is not always needed.

Explaining the cycle only in terms of EPs is biologically determinist, and only in terms of EZs is environmentally determinist, both limiting free will. The best explanation is interactionist: EPs and EZs work together, reflecting nature and nurture: the SCN provides the rhythm and EZs, especially light, entrain it.



Section B: SchizophreniaAnswer **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 5**

What is meant by co-morbidity?

[2 marks]

Co-morbidity is when two or more disorders or symptoms co-exist in the same person, eg schizophrenia and depression, so secondary disorders make the diagnosis of the primary disorder more difficult.

0 6

Aisha and her twin brother Zachary are aged 18. They both show symptoms of schizophrenia, such as hallucinations and delusions. Zachary also shows signs of avolition and speech poverty. Aisha decides to talk to her friends about her symptoms but Zachary refuses to talk to his friends.

Referring to gender bias, explain why Zachary is more likely to be diagnosed with schizophrenia than Aisha.

[3 marks]

Men show more severe negative symptoms, so as Zachary has avolition and speech poverty as well as hallucinations and delusions, he fits the diagnostic profile better. Onset is 3 to 5 years earlier in men, so at 18 Aisha may be seen as too young and stay undiagnosed. Aisha seeks social support from friends, which may reduce her symptoms, while Zachary refusing to talk makes involuntary referral more likely.



0 7

Which **one** of the following statements best describes the symptom of avolition?

Shade **one** box.

[1 mark]

A When someone does not speak very much.

☐

B When someone does not want to join in everyday activities.

☒

C When someone has beliefs that are not accurate.

☐

D When someone hears voices that are not there.

☐

0 8

Mateo has delusions. He believes that the woman who walks past his house every day is going to hurt him. He also hears voices that tell him he is a bad person. Mateo sometimes finds it difficult to go to work. He stays inside the house most of the time. Rosa, his therapist, is going to use cognitive therapy to treat Mateo.

Using your knowledge of cognitive therapy, explain how Rosa might treat Mateo.

[6 marks]

Rosa could use CBT, based on the ABC model, to reduce Mateo's

symptoms. The activating event (A) is the woman walking past his

house, his belief (B) is that she is going to hurt him, and the

consequence (C) is fear, staying inside the house and missing work.

Rosa would help Mateo challenge B through disputation, eg reality

testing to find evidence that the woman is simply walking to the shops,

so that the paranoid thought is replaced with a more rational one.

Mateo could keep a thought-catching diary of when the voices occur and

rate his emotions on an intensity scale. Rosa could teach him that the

voices are his own inner speech and use distraction, eg listening to

music when they say he is bad. Behaviour activation and homework

tasks, eg going to work twice a week, would tackle his avolition.

Turn over ►



0	9
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Explain how anti-psychotic drugs treat schizophrenia.

[3 marks]

Typical anti-psychotic drugs, such as chlorpromazine, are dopamine antagonists: they block dopamine (D2) receptors at synapses, reducing dopamine activity in the mesolimbic pathway, which relieves positive symptoms such as hallucinations and delusions. Atypical drugs, such as clozapine, act on both dopamine and serotonin receptors, so they reduce both positive and negative symptoms.

1	0
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Explain **one** limitation of using anti-psychotic drugs to treat schizophrenia.

[3 marks]

Anti-psychotic drugs have serious side effects. Typical drugs can cause weight gain, nausea and tardive dyskinesia (involuntary movements), and clozapine can cause agranulocytosis, a dangerous drop in white blood cells. As a result many patients stop taking the drugs, leading to a high drop-out rate and relapse, so the treatment is less effective in practice than trials suggest.



1 1

Describe and evaluate cognitive explanations for schizophrenia.

[12 marks]

Cognitive explanations argue that schizophrenia results from dysfunctional information processing: people with schizophrenia do not perceive, attend to, remember or interpret information correctly.

Frith (1992) proposed that a faulty metarepresentation, the ability to reflect on our own thoughts and actions, means that a person cannot recognise their own actions and thoughts as being carried out by themselves. Hearing voices is then interpreted as someone else talking to them rather than as part of their own inner dialogue, explaining hallucinations and delusions of control. Frith also proposed faulty central control, an inability to suppress automatic responses while carrying out deliberate actions, which leads to speech poverty and derailment as each word triggers associations the person cannot suppress. This also involves a lack of theory of mind, so people misread others' intentions.

There are other deficits. Perception deficits mean facial expressions are misinterpreted, leading to a misperception of intent and paranoia.

Memory deficits mean poor perceptual processing leads to poor encoding of material into working memory. Reasoning biases include the jumping to conclusions bias, where decisions are made on very little evidence, and an extreme attribution bias, where negative events are blamed on others.

Language deficits affect both language output and comprehension.

There is research support. Stirling et al. (2006) found that people with schizophrenia took over twice as long as controls to name the ink colour on the Stroop test, supporting faulty central control. Bentall et al. (1991) found that people with schizophrenia had difficulty remembering whether they or someone else had produced words, supporting faulty source

Turn over ►

monitoring and metarepresentation. Garety et al. found people with delusions made decisions on fewer pieces of evidence in the beads task, supporting jumping to conclusions.

However, much of the evidence is correlational, so we cannot be sure whether cognitive deficits cause schizophrenia or whether having schizophrenia causes the deficits. On the other hand, O'Carroll (2000) found that cognitive problems appear before the onset of the disorder, suggesting they are not simply an effect of it. Also, cognitive explanations describe the proximal cause of symptoms but cannot explain what led to the dysfunction in the first place, which is a problem of internal validity and makes the theory incomplete.

A strength is that the explanation has practical applications: knowing that thinking is dysfunctional led to CBT, which helps patients challenge delusions and reality-test voices, and attributional and reasoning biases help explain how delusions are maintained. The explanation can account for both positive and negative symptoms, and it is compatible with biological explanations, eg abnormal dopamine activity may underlie the faulty processing, giving a more holistic, interactionist account than a purely biological one.

However, it can be seen as reductionist, reducing a complex disorder to a set of simple deficits, and it ignores genetic and social factors. Overall, cognitive explanations describe the symptoms well but are best combined with biological explanations within a diathesis-stress model.



Section C: Research Methods 2

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

As part of a school project, college students decided to test if there was a difference in how quickly people can read text printed on yellow paper or green paper. They used a repeated measures design with a group of 20 psychology students. All 20 were asked to read two similar texts, and the conditions were counterbalanced as follows:

- 10 participants read Text 1 printed on yellow paper; they rested for 30 minutes, then read Text 2 printed on green paper
- the other 10 participants read Text 1 on green paper; they rested for 30 minutes, then read Text 2 printed on yellow paper.

The students collected their data using a stopwatch. They then compared the speed of reading of each participant for both the yellow paper and the green paper texts.

1	2
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The students used a repeated measures design. Explain **one** advantage of using a repeated measures design in this study.

[2 marks]

Repeated measures removes participant variables: reading ability stays constant in each condition, so quick or slow readers are compared against their own reading speed on yellow and green paper.

Turn over for the next question

Turn over ►



1	3
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The students collected the data using an interval level of measurement.

Explain what is meant by an interval level of measurement in this study.

[2 marks]

Interval data is continuous numerical data with equal spaces between values, measured objectively with a precise tool, eg reading time in seconds measured with a stopwatch.

1	4
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The students used a related t-test to check if the results were significant.

1	4	1
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Apart from the interval level of measurement, outline **two** other reasons why the related t-test was appropriate for this study.

[2 marks]

It is a test of difference, as the aim was to find a difference in reading speed between the two colours.

It is used with a repeated measures design, as the same students took part in both conditions.



1 4 . 2 The students calculated the t score for the related t-test, $t = 2.899$

Table 1 Critical values for the related t-test

	Levels of significance for a two-tailed test			
	0.1	0.05	0.02	0.01
df	/	/	/	/
18	1.734	2.101	2.552	2.878
19	1.729	2.093	2.539	2.861
20	1.725	2.086	2.528	2.845
21	1.721	2.080	2.518	2.831

The calculated value must be equal to or greater than the critical value in the table for the significance to be shown.

Degrees of freedom (df) for the related t-test can be calculated by using the formula $df = N - 1$

Using the information in **Table 1**, explain whether the results of the study are significant or not. Justify your answer.

[3 marks]

The result is significant, so the null hypothesis can be rejected and the

alternative hypothesis accepted. $N = 20$, so $df = 20 - 1 = 19$. The

critical value for a two-tailed test at $p = 0.05$ with $df = 19$ is 2.093.

The calculated value of $t = 2.899$ is greater than 2.093, so the

difference is significant (it is even significant at $p = 0.01$, where the critical value is 2.861).

Turn over for the next question

Turn over ►



1 5

The students were worried that they might have made a Type I error in their study.

1 5 . 1

What is a Type I error?

[2 marks]

A Type I error is a false positive: the null hypothesis is wrongly rejected and the alternative hypothesis accepted when the result was actually due to chance, more likely if the significance level is too lenient.

1 5 . 2

Using the critical values from **Table 1**, explain why the students were unlikely to have made a Type I error.

[2 marks]

At $df = 19$, $t = 2.899$ exceeds every critical value in the table, even 2.861 at $p = 0.01$, the most stringent level, so there is less than a 1% probability that the result occurred by chance.



1 6

After measuring the speed of reading, the students designed a 20-item memory test to investigate if the colour of the paper might also affect the ability to remember printed information.

Below are the mean values of correctly recalled memory items from each of the texts.

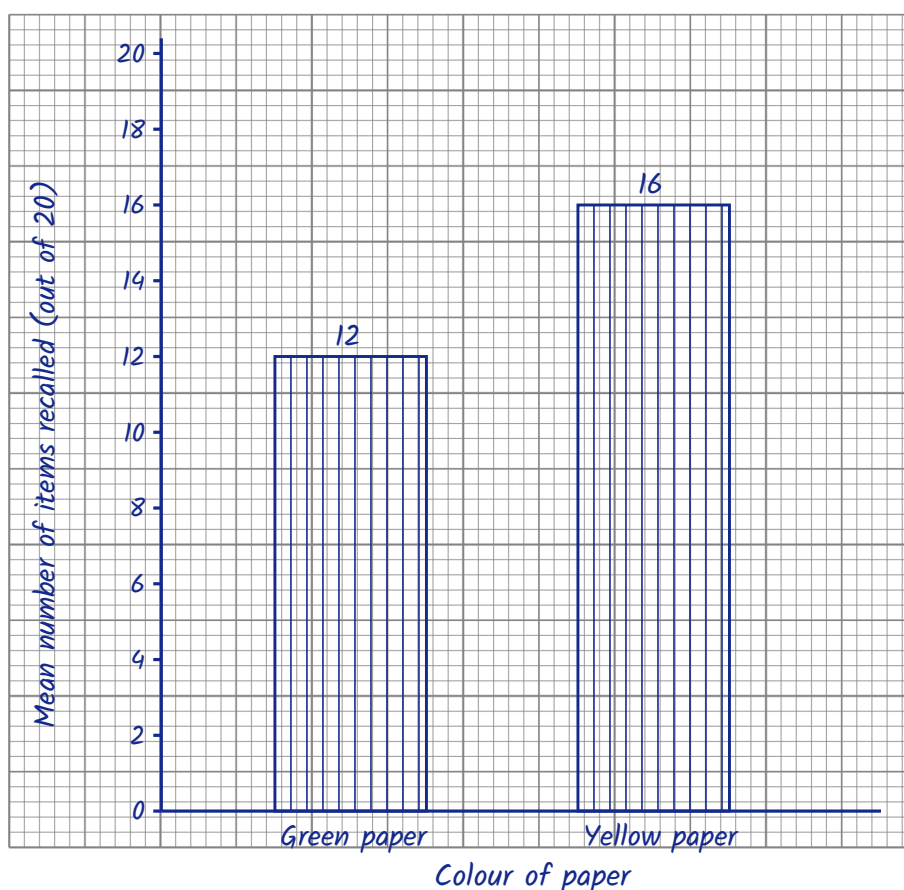
Table 2 Mean values for memory recall for green paper and yellow paper

Green paper (out of 20 items)	Yellow paper (out of 20 items)
12	16

Using the graph paper below, draw an appropriate display of the data in **Table 2**. Label your display fully, including the title.

[5 marks]

Mean number of items correctly recalled for green and yellow paper



Turn over ►



1 7

The students decided to ask the participants their opinions after they had taken part in the memory test. They did this by using a questionnaire.

Outline **one** advantage of using a questionnaire rather than an interview.

[2 marks]

Questionnaires can be given to all the participants at the same time, so many responses are collected quickly, whereas interviews must be done one at a time, which takes longer.

1 8

Write a closed question that could be used to collect participants' opinions about the difficulty of the memory test.

[1 mark]

How difficult did you find the memory test? (tick one) Very easy / Easy / Neither easy nor difficult / Difficult / Very difficult

1 9

Many psychologists use case studies as a research method.

Outline and evaluate the use of case studies in helping psychologists to understand human behaviour.

[9 marks]

A case study is a detailed, in-depth investigation of a single individual, a small distinct group or an event, taking an idiographic approach. It usually involves real-life data, as variables are not manipulated, and is often longitudinal, following the person over a long period. A variety of methods may be used, eg interviews with the person and family, observations, psychological tests, brain scans and medical records, producing both qualitative and quantitative data. For example, the case of HM, whose hippocampus was removed, was studied for over 50 years and showed that short-term and long-term memory are separate stores. One strength is that case studies provide rich, detailed data about unusual behaviour, such as brain damage, that could not be studied



experimentally for ethical reasons, as it would be unethical to cause harm deliberately. They have high ecological validity because they are based on real events, and they can challenge existing theories and generate hypotheses for future research. Participants may also benefit from access to specialist support they would not otherwise receive.

However, case studies often involve one person in unique circumstances, so findings have low population validity and cannot be generalised. As variables are not controlled, extraneous variables may be present, so cause and effect cannot be established, reducing internal validity. Much of the data relies on retrospective recall, which may be inaccurate, and the researcher may become emotionally involved with the participant, leading to subjective interpretation and biased data. They cannot be replicated, so reliability is hard to check. There are also ethical issues of confidentiality and privacy, as individuals may be identifiable, and informed consent may be difficult if the person has impaired capacity. Overall, case studies are valuable for understanding rare behaviour but should be supported by nomothetic research.

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END OF QUESTIONS



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box*

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



