

Please write clearly in block capitals.

Centre number

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Candidate number

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Surname

StemUp Model Solution

Forename(s)

Candidate signature

A-level PSYCHOLOGY

Paper 2 Psychology in context

Wednesday 14 June 2017

Afternoon

Time allowed: 2 hours

Materials

For this paper you may use:

- a calculator.

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.
- 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 96.
- Questions should be answered in continuous prose. You will be assessed on your ability to:
 - use good English
 - organise information clearly
 - use specialist vocabulary where appropriate.

For Examiner's Use	
Section	Mark
A	
B	
C	
TOTAL	



Section A**Approaches in psychology**

Answer **all** questions in this section.

A recent study showed that Alzheimer's disease may be partly inherited.

John's father suffered from Alzheimer's disease. John is keen to get genetically tested to see if he will develop Alzheimer's disease.

0	1
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Explain why John's genotype will **not** reveal whether he will suffer from Alzheimer's disease.

[4 marks]

A genetic test only reveals John's genotype, the genes he has inherited, not his phenotype, which is how those genes are actually expressed.

Even if John has inherited his father's genes, this only shows a genetic predisposition (vulnerability) to Alzheimer's, not that he will definitely develop it, as the disease is only partly inherited.

Whether the genes are expressed depends on an interaction with environmental factors, such as diet, exercise and education

Extra space *(diathesis-stress), so John could carry the genes and never develop Alzheimer's.*



0 2

Describe the structure of the personality according to the psychodynamic approach.

[4 marks]

According to Freud, personality has a tripartite structure made up of three parts: the id, the ego and the superego.

The id is present from birth and is the primitive, unconscious part. It is selfish and irrational and operates on the pleasure principle, demanding immediate gratification.

The ego develops at around 18 months to 3 years and works on the reality principle. It is the rational, conscious part which mediates between the id and the superego, using defence

Extra space *mechanisms such as repression to reduce anxiety.*

The superego forms at around 3 to 6 years, at the end of the phallic stage, and works on the morality principle. It is our internalised conscience, based on parental and societal values, and punishes the ego with guilt.

The three parts are in dynamic conflict, and childhood experiences shape how they develop and so affect adult behaviour.



Tatiana's parents are concerned about her mobile phone use. She is an anxious child and has low self-esteem. Tatiana only feels good about herself when she receives messages or positive comments on social media. She feels safe when she has her phone and socially isolated without it.

Tatiana's parents worry that her dependence on her mobile phone is starting to affect her well-being and achievement at school.

0	3
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Outline and evaluate the humanistic approach. Refer to Tatiana's behaviour in your answer.

[16 marks]

You may use this space to plan your answer.

The humanistic approach, developed by Maslow and Rogers, emphasises free will, subjective experience and personal growth. Humanists see people as active agents who make choices and are motivated to self-actualise, which means fulfilling their full potential. Maslow proposed a hierarchy of needs. The four lower levels are deficiency needs: physiological, safety, love and belongingness, and esteem needs. Each must be met before a person is motivated to move to the next level, and only then can they reach self-actualisation. Tatiana 'feels safe when she has her phone', so her phone is meeting her safety needs. She feels 'socially isolated without it', suggesting she relies on it for love and belongingness. Her 'low self-esteem' shows her esteem needs are not being met from within. As these deficiency needs are unmet, she cannot progress towards self-actualisation, which may explain why her



achievement at school is suffering.

Rogers argued that well-being depends on congruence between the self-concept and the ideal self. A large gap between the two (incongruence) leads to low self-worth and anxiety. Incongruence develops when parents set conditions of worth, rather than giving unconditional positive regard. Tatiana's anxiety and low self-esteem suggest incongruence, and her self-worth depends on conditions of worth set by others, as she only feels good about herself when she receives positive comments on social media. Rogers' client-centred therapy could help her, as a non-directive therapist offering empathy, genuineness and unconditional positive regard would help her value herself without needing approval through her phone.

One strength of the approach is its influence on counselling.

Client-centred therapy is widely used, for example in the NHS, and Cooper et al. (2010) found it effective for mild to moderate depression and anxiety, so it could genuinely benefit Tatiana's well-being. However, it may be less effective for more severe disorders.

A further strength is that the approach is not reductionist. It takes a holistic view of the whole person, rather than reducing behaviour to stimulus-response links or genes as behaviourism and the biological approach do. This may give it more validity when explaining complex behaviour such as Tatiana's phone dependence, which involves her safety, belonging and self-esteem at once.

However, a major weakness is the lack of empirical evidence.

Concepts such as self-actualisation and congruence are abstract and difficult to operationalise and test experimentally, and research relies



on self-report measures such as the Q-sort, which are open to social desirability bias. The approach is therefore unscientific and its claims are hard to falsify.

The approach may also be culturally biased, as self-actualisation and individual growth reflect individualist Western values and may not apply in collectivist cultures, where the needs of the group are prioritised.

Finally, its emphasis on free will can be challenged. The behaviourist approach would argue that each message or 'like' acts as positive reinforcement, increasing Tatiana's phone use, so her behaviour may be shaped by the environment rather than freely chosen. Overall, the humanistic approach offers a useful, optimistic way to understand and help Tatiana, but it is best combined with more scientific approaches.

Extra space



[illegible]

Section B**Biopsychology**

Answer **all** questions in this section.

0	4
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Explain the process of synaptic transmission.

[4 marks]

When an electrical impulse (action potential) travels down the axon of the presynaptic neuron and reaches the presynaptic terminal, it causes synaptic vesicles to move to and fuse with the presynaptic membrane.

The vesicles release neurotransmitters (e.g. serotonin or dopamine) into the synaptic cleft by exocytosis. The neurotransmitters diffuse across the gap and bind to specific receptor sites on the postsynaptic membrane, which converts the chemical message back

Extra space *into an electrical signal.*

Depending on the neurotransmitter, this causes either excitation (depolarisation), making the postsynaptic neuron more likely to fire, e.g. adrenaline, or inhibition (hyperpolarisation), making it less likely to fire, e.g. GABA. The postsynaptic neuron sums these inputs (summation) and fires if the threshold is reached.

The neurotransmitter is then broken down by enzymes or taken back up into the presynaptic neuron (reuptake). Transmission is therefore one-way, from pre- to postsynaptic neuron.



Lotta's grandmother suffered a stroke to the left hemisphere, damaging Broca's area and the motor cortex.

0	5
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Using your knowledge of the functions of Broca's area and the motor cortex, describe the problems that Lotta's grandmother is likely to experience.

[4 marks]

Broca's area, in the left frontal lobe, is responsible for speech production. As it is damaged, Lotta's grandmother is likely to suffer from Broca's (expressive) aphasia. Her speech will be slow, laborious and lack fluency, and she will speak in short sentences which still make sense but take great effort.

She may especially struggle with function words such as 'it' and 'the', although her understanding of language should be unaffected.

The motor cortex controls voluntary movement. Because the stroke

Extra space *was in the left hemisphere, and each hemisphere controls the opposite (contralateral) side of the body, she is likely to have loss of muscle control, weakness or paralysis on the right side of her body, such as difficulty using her right hand to write or her right leg to walk.*

Lotta worries that because of her grandmother's age she will not be able to make any recovery.

0	6
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Using your knowledge of plasticity and functional recovery of the brain after trauma, explain why Lotta might be wrong.

[4 marks]

Lotta might be wrong because the brain shows plasticity throughout life, so even in old age her grandmother's brain can reorganise after trauma (functional recovery).

Undamaged areas, e.g. in the right hemisphere, may take over the lost speech and motor functions. Axon sprouting grows new nerve



endings to connect with undamaged neurons, and denervation

*supersensitivity makes neurons that do a similar job more sensitive,
compensating for lost neurons.*

Extra space *Recovery may be slower with age, but Bezzola et al.*

*(2012) found golf training changed the motor cortex of people aged
40 to 60, so physiotherapy and speech therapy could aid her
recovery.*

A researcher wants to investigate the effectiveness of physiotherapy in the recovery of stroke patients with brain damage. Carers of stroke patients will be sent questionnaires to produce quantitative data.

0	7
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Explain **one** disadvantage of obtaining quantitative data in this study.

[2 marks]

*Quantitative data lacks depth and detail. A carer's rating of
improvement, e.g. 6 out of 10, would not explain how or why
physiotherapy helped the patient's daily life, reducing the validity of
the findings.*

0	8
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Write **one** question that could be used in the researcher's questionnaire to produce quantitative data and **one** question that could be used in the researcher's questionnaire to produce qualitative data.

[2 marks]

Quantitative question: *On a scale of 1 to 10, how much has the
patient's mobility improved since starting physiotherapy?*

Qualitative question: *Describe in your own words how physiotherapy
has helped the patient you care for.*



0 9

Outline and evaluate **one or more** ways of studying the brain.**[8 marks]**

Functional magnetic resonance imaging (fMRI) detects changes in blood oxygenation and flow that occur as a result of neural activity. When a brain area is more active it consumes more oxygen, so blood flow to it increases (the haemodynamic response). This produces 3D activation maps, and activity during a task is compared with a baseline task.

An electroencephalogram (EEG) records electrical activity as brain waves through electrodes on the scalp. Event-related potentials (ERPs) are extracted from EEG data by statistical averaging to isolate the brain's response to a specific stimulus.

A strength of fMRI is that it is non-invasive and uses no radiation, so it is risk-free. It also has high spatial resolution (1 to 2 mm), so it can clearly localise functions, and unlike post-mortems it shows the activity of a living brain rather than just structure. However, fMRI has poor temporal resolution, with a lag of about 5 seconds between neural activity and the image. It is also expensive, leading to small samples which reduce validity, and as it measures blood flow rather than neural activity directly, it cannot show causation.

In contrast, EEGs and ERPs have excellent temporal resolution, accurate to a millisecond, and are much cheaper, so larger samples can be used. EEG has real-world value in diagnosing epilepsy. However, both have poor spatial resolution, as they only detect activity near the scalp and cannot pinpoint activity in deeper structures. Overall, combining techniques gives the most valid



picture of brain function.

Extra space



Section C

Research methods

Answer **all** questions in this section.

For each multiple-choice 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. 

A psychologist wanted to test whether listening to music improves running performance.

The psychologist conducted a study using 10 volunteers from a local gym. The psychologist used a repeated measures design. Half of the participants were assigned to condition A (without music) and half to condition B (with music).

All participants were asked to run 400 metres as fast as they could on a treadmill in the psychology department. All participants were given standardised instructions. All participants wore headphones in both conditions. The psychologist recorded their running times in seconds. The participants returned to the psychology department the following week and repeated the test in the other condition.

1 0

Identify the type of experiment used in this study. Shade **one** box only.

A Laboratory

☒

B Natural

☐

C Quasi

☐

D Research

☐

[1 mark]



1 1

Identify the operationalised dependent variable in this study.

[2 marks]

The time taken in seconds for each participant to run 400 metres on the treadmill.

The results of the study are given in **Table 1** below.

Table 1 Mean number of seconds taken to complete the 400m run and the standard deviation for both conditions

	Condition A (without music)	Condition B (with music)
Mean 400m time (s)	123	117
Standard deviation	9.97	14.5

1 2

Explain why a histogram would **not** be an appropriate way of displaying the means shown in **Table 1**.

[2 marks]

A histogram is used to show the frequency distribution of continuous data, with a score for each participant on a continuous scale along the x-axis and the bars touching.

Table 1 shows only two mean scores from two separate, discrete

Extra space *conditions (with music and without music), which are categorical, not continuous, so a histogram would not be appropriate.*



1 3

Name a more appropriate graph to display the means shown in **Table 1**. Suggest appropriate X (horizontal) and Y (vertical) axis labels for your graph choice.

[3 marks]

Name of graph: Bar chart

X axis label: Music condition (A: without music, B: with music)

Y axis label: Mean time taken to run 400 m (seconds)

1 4

What do the mean and standard deviation values in **Table 1** suggest about the participants' performances with and without music? Justify your answer.

[4 marks]

Mean: the participants performed better (ran faster) with music,
because the mean time to complete the 400m run was lower in
condition B with music (117 s) than in condition A without music
(123 s), a difference of 6 seconds.

Standard deviation: the participants' performances were more
consistent (less spread out around the mean) without music,
because the standard deviation was smaller in condition A (9.97)
than in condition B (14.5). With music the times varied more,

Extra space suggesting music improved some participants' times
more than others.



1	5
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Calculate the percentage decrease in the mean time it took participants to run 400 metres when listening to music. Show your workings. Give your answer to three significant figures.

[4 marks]

$$\text{Difference in means} = 123 - 117 = 6 \text{ seconds}$$

$$\text{Percentage decrease} = (\text{difference} \div \text{original mean}) \times 100$$

$$= (6 \div 123) \times 100$$

$$= 0.048780... \times 100$$

$$= 4.878...\%$$

$$\text{Answer to 3 significant figures} = 4.88\%$$

Extra space



1 6

The researcher used a directional hypothesis and analysed the data using a related t-test. The calculated value of t where degrees of freedom (df) = 9 was 1.4377. He decided to use the 5% level of significance.

Table 2 Table of critical values of t

Level of significance for a one-tailed test	0.05	0.025
Level of significance for a two-tailed test	0.10	0.05
$df =$ 1	6.314	12.706
2	2.920	4.303
3	2.353	3.182
4	2.132	2.776
5	2.015	2.571
6	1.943	2.447
7	1.895	2.365
8	1.860	2.306
9	1.833	2.262
10	1.812	2.228

Calculated value of t must be equal to or greater than the critical value in this table for significance to be shown.

Give **three** reasons why the researcher used a related t-test in this study and, using **Table 2**, explain whether or not the results are significant.

[5 marks]

1) The hypothesis predicted a difference between the two conditions (running times with and without music).

2) A repeated measures design was used, as the same 10 participants ran in both conditions, so the data is related.

3) The data (running time in seconds) is at the interval/ratio level, so a parametric test can be used.

The critical value of t for a one-tailed (directional) test at the 0.05 level where $df = 9$ is 1.833. The calculated value of $t = 1.4377$ is less than the critical value of 1.833, so the result is not significant at the 5% level ($p > 0.05$). The null hypothesis is accepted.



1 7

What is meant by a Type II error? Explain why psychologists normally use the 5% level of significance in their research.

[3 marks]

A Type II error is a false negative. It occurs when the researcher accepts the null hypothesis and rejects the alternative hypothesis when in fact there is a real difference or relationship, so a genuine effect is overlooked because the significance level used was too stringent (e.g. 1%).

Psychologists use the 5% level because it strikes the best balance

Extra space *between the risk of making a Type I error (false positive, too lenient a level such as 10%) and a Type II error (too stringent a level).*

1 8

Identify **one** extraneous variable that could have affected the results of this study. Suggest why it would have been important to control this extraneous variable and how it could have been controlled in this study.

[3 marks]

The type of music played to each participant could be an extraneous variable, as some participants may have listened to fast, upbeat music and others to slow music.

This is important to control because fast music with a strong beat may make participants run faster than slow music, so the change in running time (the DV) may be due to the type of music rather

Extra space *than the presence of music itself (the IV).*

It could be controlled by playing every participant the same piece of music, at the same tempo and volume, through the headphones



in condition B.

1	9
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The report was submitted for peer review and a number of recommendations were advised.

Describe the process and purposes of peer review.

[6 marks]

Peer review is the independent scrutiny of a piece of research by other psychologists who are experts in the same field before it is published in an academic journal.

Process: the researcher submits the report to a journal editor, who sends it to several reviewers, usually anonymously (a single- or double-blind review), to reduce bias. The reviewers assess the report's validity, originality and significance, the appropriateness of the methods and design, the data analysis, and whether the conclusions are supported by the results. They then recommend that the report is accepted as it is, accepted with revisions, revised and resubmitted, or rejected. The editor makes the final decision based on the reviewers' comments.

Extra space *Purposes: peer review ensures that only high-quality, accurate and relevant research is published, preventing fraudulent or flawed findings from entering the scientific knowledge base. It allows reviewers to suggest improvements to the research. It is also used by funding bodies to assess research proposals for their aims, quality and value before deciding whether to allocate funding.*



People's perception of how they spend their time at the gym is often not very accurate. Some spend more time chatting than on the treadmill. A psychologist decides to observe the actual behaviour of an opportunity sample of gym users at a local gym.

2	0
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Explain why it is more appropriate for the psychologist to use an observation than a questionnaire in this case.

[3 marks]

If gym users completed a questionnaire about how they spend their time, they might give socially desirable answers, for example overestimating the time they spend exercising on the treadmill and underestimating the time spent chatting, or they may simply misremember, as the stem states people's perceptions are often inaccurate.

Extra space *An observation records what gym users actually do rather than what they say they do, so the data collected would have greater validity.*



2	1
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Design an observational study to investigate how people spend their time at the gym.

In your answer you will be awarded credit for providing appropriate details of:

- type of observation with justification
- operationalised behavioural categories
- use of time and/or event sampling with justification
- how reliability of data collection could be assessed.

[12 marks]

You may use this space to plan your answer.

Type of observation: I would carry out a naturalistic, covert, non-participant observation at a local gym. It would be naturalistic as gym users would be observed in their usual setting, which increases ecological validity. It would be covert, with the observer posing as an ordinary gym member (or using the gym's existing CCTV, with the manager's permission), so that participants do not know they are being watched. This reduces participant reactivity, such as people exercising more than usual because they feel watched, and so increases internal validity. It would be non-participant so that the observer can concentrate fully on recording behaviour accurately. As the gym is a public place, observing without consent is acceptable, but identities would be kept confidential.

Behavioural categories: I would use a structured observation with a behaviour checklist of clearly operationalised, observable categories.



These would be: 1) running or walking on the treadmill; 2) using a weights machine or free weights, i.e. lifting; 3) talking to another gym user (mouth moving while facing another person, not exercising); 4) using a mobile phone (looking at or typing on the screen); 5) resting alone without exercising, e.g. sitting on a bench; 6) drinking water or towelling off. The categories do not overlap, so each behaviour can only be recorded in one category.

Sampling: I would use time sampling. Each observer would focus on one target gym user for a 30-minute session and record which behavioural category they were showing every 30 seconds (60 observations per person). This is justified because people perform behaviours like chatting and running continuously for long periods, which would be very hard to count as single events, and time sampling allows the proportion of time spent in each activity to be calculated. I would also use event sampling to count the number of times the target person starts a conversation with another gym user, as this is a discrete event.

Reliability: I would assess inter-observer reliability. Two observers would be trained in using the behavioural categories and would carry out a pilot study first. They would then observe the same gym users at the same time but independently, without conferring, and tally their observations in the same time intervals. Their tallies for each category would be compared using a correlation (e.g. Spearman's rho). A correlation coefficient of +0.80 or above would show good inter-observer reliability. If it is lower, the categories would be redefined and the observers retrained. If CCTV recordings were used, intra-observer reliability could also be checked by the



*same observer coding the recording again later and correlating the
two sets of data.*

Extra space



[illegible]

END OF QUESTIONS

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