Please check the examination details below before entering your candidate information

Candidate surname	Other names
StemUp Model Solution	

Centre Number | Candidate Number

Pearson Edexcel International Advanced Level

Tuesday 11 June 2024

Afternoon (Time: 2 hours)

Paper reference **WPS04/01**

Psychology

International Advanced Level

UNIT 4: Clinical Psychology and Psychological Skills

You do not need any other materials.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided – *there may be more space than you need.*

Information

- The total mark for this paper is 96.
- The marks for **each** question are shown in brackets – *use this as a guide as to how much time to spend on each question.*
- The list of formulae and statistical tables are printed at the start of this paper.
- Candidates may use a calculator.

Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

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FORMULAE AND STATISTICAL TABLES

Standard deviation (sample estimate)

$$\sqrt{\left(\frac{\sum\left(x-\bar{x}\right)^2}{n-1}\right)}$$

Spearman's rank correlation coefficient

$$1-\frac{6\sum d^2}{n\left(n^2-1\right)}$$

Critical values for Spearman's rank

	Level of significance for a one-tailed test				
	0.05	**0.025**	**0.01**	**0.005**	**0.0025**
	Level of significance for a two-tailed test				
N	**0.10**	**0.05**	**0.025**	**0.01**	**0.005**
5	0.900	1.000	1.000	1.000	1.000
6	0.829	0.886	0.943	1.000	1.000
7	0.714	0.786	0.893	0.929	0.964
8	0.643	0.738	0.833	0.881	0.905
9	0.600	0.700	0.783	0.833	0.867
10	0.564	0.648	0.745	0.794	0.830
11	0.536	0.618	0.709	0.755	0.800
12	0.503	0.587	0.678	0.727	0.769
13	0.484	0.560	0.648	0.703	0.747
14	0.464	0.538	0.626	0.679	0.723
15	0.446	0.521	0.604	0.654	0.700
16	0.429	0.503	0.582	0.635	0.679
17	0.414	0.485	0.566	0.615	0.662
18	0.401	0.472	0.550	0.600	0.643
19	0.391	0.460	0.535	0.584	0.628
20	0.380	0.447	0.520	0.570	0.612
21	0.370	0.435	0.508	0.556	0.599
22	0.361	0.425	0.496	0.544	0.586
23	0.353	0.415	0.486	0.532	0.573
24	0.344	0.406	0.476	0.521	0.562
25	0.337	0.398	0.466	0.511	0.551
26	0.331	0.390	0.457	0.501	0.541
27	0.324	0.382	0.448	0.491	0.531
28	0.317	0.375	0.440	0.483	0.522
29	0.312	0.368	0.433	0.475	0.513
30	0.306	0.362	0.425	0.467	0.504

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

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Chi-squared distribution formula

$$X^2 = \sum \frac{(O-E)^2}{E} \qquad df = (r-1)(c-1)$$

Critical values for chi-squared distribution

	Level of significance for a one-tailed test					
	0.10	**0.05**	**0.025**	**0.01**	**0.005**	**0.0005**
	Level of significance for a two-tailed test					
df	**0.20**	**0.10**	**0.05**	**0.025**	**0.01**	**0.001**
1	1.64	2.71	3.84	5.02	6.64	10.83
2	3.22	4.61	5.99	7.38	9.21	13.82
3	4.64	6.25	7.82	9.35	11.35	16.27
4	5.99	7.78	9.49	11.14	13.28	18.47
5	7.29	9.24	11.07	12.83	15.09	20.52
6	8.56	10.65	12.59	14.45	16.81	22.46
7	9.80	12.02	14.07	16.01	18.48	24.32
8	11.03	13.36	15.51	17.54	20.09	26.12
9	12.24	14.68	16.92	19.02	21.67	27.88
10	13.44	15.99	18.31	20.48	23.21	29.59
11	14.63	17.28	19.68	21.92	24.73	31.26
12	15.81	18.55	21.03	23.34	26.22	32.91
13	16.99	19.81	22.36	24.74	27.69	34.53
14	18.15	21.06	23.69	26.12	29.14	36.12
15	19.31	22.31	25.00	27.49	30.58	37.70
16	20.47	23.54	26.30	28.85	32.00	39.25
17	21.62	24.77	27.59	30.19	33.41	40.79
18	22.76	25.99	28.87	31.53	34.81	42.31
19	23.90	27.20	30.14	32.85	36.19	43.82
20	25.04	28.41	31.41	34.17	37.57	45.32
21	26.17	29.62	32.67	35.48	38.93	46.80
22	27.30	30.81	33.92	36.78	40.29	48.27
23	28.43	32.01	35.17	38.08	41.64	49.73
24	29.55	33.20	36.42	39.36	42.98	51.18
25	30.68	34.38	37.65	40.65	44.31	52.62
26	31.80	35.56	38.89	41.92	45.64	54.05
27	32.91	36.74	40.11	43.20	46.96	55.48
28	34.03	37.92	41.34	44.46	48.28	56.89
29	35.14	39.09	42.56	45.72	49.59	58.30
30	36.25	40.26	43.77	46.98	50.89	59.70
40	47.27	51.81	55.76	59.34	63.69	73.40
50	58.16	63.17	67.51	71.42	76.15	86.66
60	68.97	74.40	79.08	83.30	88.38	99.61
70	79.72	85.53	90.53	95.02	100.43	112.32

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

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Wilcoxon Signed Ranks test process

- Calculate the difference between two scores by taking one from the other
- Rank the differences giving the smallest difference Rank 1

  Note: do not rank any differences of 0 and when adding the number of scores, do not count those with a difference of 0, and ignore the signs when calculating the difference
- Add up the ranks for positive differences
- Add up the ranks for negative differences
- T is the figure that is the smallest when the ranks are totalled (may be positive or negative)
- N is the number of scores left, ignore those with 0 difference

Critical values for the Wilcoxon Signed Ranks test

	Level of significance for a one-tailed test		
	0.05	0.025	0.01
	Level of significance for a two-tailed test		
n	0.1	0.05	0.02
N=5	0	–	–
6	2	0	–
7	3	2	0
8	5	3	1
9	8	5	3
10	11	8	5
11	13	10	7
12	17	13	9

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SECTION A

Clinical Psychology

Answer ALL questions. Write your answers in the spaces provided.

1 In your studies of clinical psychology, you will have learned about schizophrenia.

(a) Give **one** symptom of schizophrenia.

(1)

Delusions, such as delusions of persecution where the person believes others are plotting against them.

(b) Describe the function of neurotransmitters as an explanation for schizophrenia.

(4)

The dopamine hypothesis suggests schizophrenia is caused by abnormal dopamine activity. High levels of dopamine in the mesolimbic pathway are linked to positive symptoms such as hallucinations and delusions, and delusions have been connected with increased subcortical release of dopamine acting on D2 receptors. In contrast, low dopamine activity in the mesocortical pathway is associated with negative symptoms such as alogia and avolition. Glutamate is also implicated: decreased glutamate uptake at NMDA receptors leads to reduced activation, which is linked to positive, negative and cognitive symptoms. Support comes from antipsychotics that block D2 receptors reducing positive symptoms.

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(c) Analyse **one** biological explanation for schizophrenia, other than the function of neurotransmitters.

(6)

Genes: there is an increased risk of developing schizophrenia if a family member has the disorder, through the inheritance of genes such as the NRG-1 gene. Kendler et al. (1985) found that first-degree relatives of people with schizophrenia were more likely to develop it than the general population, so the risk runs in families.

Identical (MZ) twins share 100% of their genes and have a higher risk of both developing schizophrenia than non-identical twins. Gottesman and Shields (1972) found a 58% concordance rate for schizophrenia in MZ twins reared apart, which suggests genes play a role even when the environment differs, as the twins were not raised together.

However, genes cannot be the whole explanation, otherwise the concordance rate for genetically identical MZ twins would be 100%. The NRG-1 gene has a role in the expression and activation of glutamate and in neurodevelopment, so genes may only give a predisposition (diathesis) that makes someone vulnerable, and environmental triggers such as stress or cannabis use are needed for the disorder to develop. Family studies also cannot separate genes from a shared family environment, so the genetic explanation alone is reductionist.

(Total for Question 1 = 11 marks)

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2 In your studies of schizophrenia, you will have learned about the following contemporary study in detail:

- Suzuki et al. (2014).

(a) State **one** aim of Suzuki et al. (2014).

(1)

To investigate the nutritional status of Japanese inpatients with schizophrenia, eg how many were underweight or had nutritional deficiencies.

(b) Describe how nutritional status was measured in the study by Suzuki et al. (2014).

(2)

A blood sample was taken from each patient after fasting for at least 9 hours, and was used to measure total protein, total cholesterol, triglyceride levels and fasting plasma glucose. Each was compared with a cut-off, eg hypoglycaemia was defined as a fasting plasma glucose level below 70 mg/dL. Body mass index (BMI) was also calculated from height and weight.

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(c) Explain **two** strengths of the study by Suzuki et al. (2014) in terms of validity.

(4)

1 *The sample was 333 real inpatients aged between 16 and 80 years old who had been admitted to psychiatric hospitals with a diagnosis of schizophrenia, so they are likely to be representative of Japanese inpatients with schizophrenia. This gives the findings about nutrition high population validity, as they reflect the target population.*

2 *The study took place in nine everyday psychiatric hospitals where patients with schizophrenia would normally be admitted and treated. This gives the findings about weight and nutrition high ecological validity, because the setting reflects real-life hospitalisation and the patients' normal diet and routine rather than an artificial setting.*

(Total for Question 2 = 7 marks)

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3 Amy is planning to research the effectiveness of Cognitive Behavioural Therapy (CBT). She plans to use an interview to gather qualitative and quantitative data from patients who are taking part in Cognitive Behavioural Therapy (CBT).

Amy visits a therapist who gives permission for her to approach their patients to take part in the research.

(a) Describe how Amy could use an opportunity sampling technique to gather the participants for her research.

(2)

Amy could go to the therapist's clinic every day for a week and approach patients who happen to be there for their CBT appointments at that time. She would ask these patients if they are willing to take part in her interview about their experiences of CBT, and use whoever agrees.

(b) Describe how Amy could plan her interview to investigate the effectiveness of Cognitive Behavioural Therapy (CBT).

(4)

First Amy would gain fully informed consent from each patient by explaining the aim of her research into CBT and their right to withdraw. She would prepare an interview schedule in advance listing the questions about CBT she will ask. She would plan structured closed questions to gather quantitative data, eg "On a scale of 1 to 10, how anxious have you felt this week?" or "How many CBT sessions have you attended?". She would also plan open-ended questions to gather qualitative data, eg "In what ways do you think CBT has helped you?". She could pilot the schedule first and record the interviews to transcribe them later.

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(c) Explain **two** strengths of Amy using an interview to investigate the effectiveness of Cognitive Behavioural Therapy (CBT).

(4)

1 *Amy can gather in-depth, detailed data from the patients having CBT about how they feel and what they have experienced, and can ask follow-up questions. This gives a more holistic picture of how effective CBT is, rather than oversimplified data such as session attendance rates, which ignore individual experiences.*

2 *Patients may feel relaxed and able to be honest about their CBT in an interview, because it allows an open conversation in which Amy can reassure them. This gives the findings strong validity, as they reflect the patients' real experiences, emotions and truthful beliefs about the effectiveness of their CBT.*

(Total for Question 3 = 10 marks)

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4 Rahul has been finding it difficult to take part in his usual daily activities. He has found it increasingly difficult to leave his house. Rahul feels worried and nervous when meeting new people and he has stopped attending social events with his friends.

A psychiatrist and their trainee have both independently diagnosed Rahul with the same mental health condition using the DSM classification system. Rahul's treatment is helping him return to his usual daily activities.

(a) Describe how Rahul's mental health condition could be defined as a failure to function adequately.

(2)

Rahul is unable to cope with the demands of everyday life, as he cannot take part in his usual daily activities or leave his house, which causes him suffering. He also cannot cope with social situations, as he is fearful of meeting new people and has stopped attending social events with his friends.

(b) Explain **one** reason why Rahul believes his diagnosis is valid.

(2)

Rahul received the same diagnosis independently from both the psychiatrist and the trainee using the DSM, and his treatment for that condition is working. This is supported by Brown et al. (2001), who found that two interviews using DSM-IV criteria gave the same diagnoses of anxiety and mood disorders in 362 outpatients, so the DSM gives accurate diagnoses.

(Total for Question 4 = 4 marks)

TOTAL FOR SECTION A = 32 MARKS

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QUESTION 5 BEGINS ON THE NEXT PAGE.

SECTION B

Clinical Psychology

Answer the question. Write your answer in the space provided.

5 Evaluate the effectiveness of family therapy as a treatment for schizophrenia.

(16)

Family therapy is a psychological treatment in which a patient with schizophrenia attends therapy sessions with their family members and any designated caregivers. It addresses the environmental, social and emotional issues around the patient, such as high expressed emotion (criticism, hostility and emotional over-involvement), which is linked to relapse. A key part is psychoeducation, which increases family members' knowledge of schizophrenia so they understand the symptoms, and families are taught communication and problem-solving skills to reduce stress at home. It is not physically invasive, as it is based on sharing information and feelings. Family therapy usually runs alongside drug therapy, where antipsychotics suppress hallucinations and delusions, rather than being used alone.

There is strong evidence that family therapy is effective. Pharoah et al. (2010) reviewed studies of family interventions and found positive impacts on patient recovery, a reduction in relapse and improved social functioning. Bird et al. (2010) showed that family therapy in the early stages of psychosis significantly reduced relapse and hospital readmission rates, which suggests that it may be most effective if started early. Pilling et al. (2002) found a link between family therapy interventions and better adherence to medication, and as many patients relapse because they stop taking their drugs, this is an important way that family therapy reduces relapse indirectly.

Family therapy is also effective in treating the wider impact of schizophrenia, not only the patient. Magliano et al. (2005) found improved social functioning in the caregivers of family members with schizophrenia, so it reduces the burden on families, who are often the main

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carers. It is also less invasive than drugs or deep brain stimulation and has no physical side effects such as tardive dyskinesia.

However, family therapy may only be effective if the family engages positively. Kavanagh's review of expressed emotion research found that patients living in families with high levels of negative attitudes had a 48% chance of relapse, so if a family stays hostile or critical the therapy will be less effective. Attending sessions is demanding for families in terms of transport, time, motivation and energy, which can lead to high dropout rates and reduce its effectiveness. It is also of limited use for patients without a supportive family.

Another weakness is that family therapy requires the person with schizophrenia to engage and explain how the disorder affects them. This may not be possible during an acute episode, as they may be living in a different reality and may not trust their family, for example due to delusions of persecution. In comparison, drugs such as chlorpromazine block dopamine receptors and produce a reduction in positive symptoms quickly, so family therapy is not the only treatment that should be considered. Family therapy also does not address the biological cause of schizophrenia, such as excess dopamine, so it helps manage the patient and family life rather than cure the disorder.

In conclusion, family therapy is an effective treatment for reducing relapse and readmission and for improving social functioning for both patients and carers, as shown by Pharoah et al. (2010) and Bird et al. (2010). However, its effectiveness depends on the family engaging and on the patient's symptoms being stable enough to take part, so it is most effective when used early and combined with antipsychotic drugs rather than on its own.

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(Total for Question 5 = 16 marks)

TOTAL FOR SECTION B = 16 MARKS

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SECTION C

Psychological Skills

Answer ALL questions. Write your answers in the spaces provided.

6 Beverley is a school nurse investigating healthy eating habits in children. She counts how many children choose to eat fruit, cake or both for a snack during breaktime at a school.

(a) Identify the level of measurement for Beverley's data.

(1)

Nominal data, as she is counting (tallying) how many children fall into each snack category.

The results of Beverley's investigation are shown in **Figure 1**.

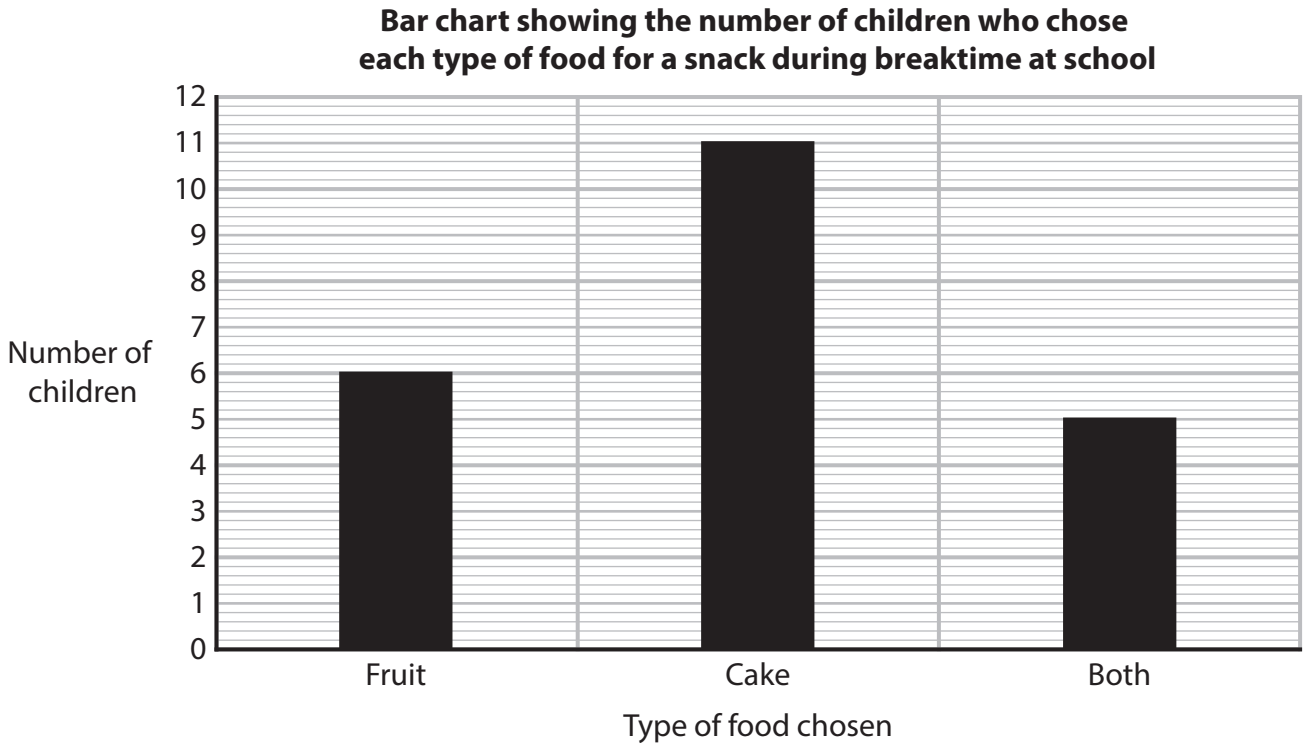


Figure 1

(b) Identify the modal (mode) food type chosen by the children from **Figure 1**.

(1)

Modal food type *Cake*

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(c) Calculate the ratio of children who chose only fruit to those who chose only cake.

You **must** give your answer in the lowest form.

(1)

Space for calculations

Fruit only = 6, cake only = 11

Ratio = 6 : 11 (6 and 11 share no common factor, so this is the lowest form)

Ratio *6 : 11*

(d) Calculate the percentage of children who chose only fruit as their snack out of all the children in Beverley's investigation.

You **must** give your answer to **two** decimal places.

(1)

Space for calculations

Total = 6 + 11 + 5 = 22 children

6 ÷ 22 × 100 = 27.2727...% = 27.27%

Percentage *27.27%*

(Total for Question 6 = 4 marks)

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7 Jamie investigated gender differences in obedience by observing males and females at a train station. Jamie wanted to see if they would follow an instruction announced loudly over a speaker that said, "passengers must not run on the platform when the train arrives".

Jamie counted how many males and females did or did not run when the arrival of their train was announced.

Jamie used a chi-squared test to find out if the results were significant.

(a) Calculate the chi-squared for the data gathered by Jamie by completing **Table 1**.

The formulae and statistical tables can be found at the front of the paper.

Your answers should **all** be correct to **two** decimal places.

(4)

		Observed	Expected	O-E	$(O-E)^2$	$(O-E)^2/E$
Males	**Ran on the platform**	41	38.03	2.97	8.82	0.23
	Did not run on the platform	21	23.97	−2.97	8.82	0.37
Females	**Ran on the platform**	51	53.97	−2.97	8.82	0.16
	Did not run on the platform	37	34.03	2.97	8.82	0.26
					Chi-squared =	1.02

Table 1

Space for calculations

$O - E$: $41 - 38.03 = 2.97$, $21 - 23.97 = -2.97$, $51 - 53.97 = -2.97$, $37 - 34.03 = 2.97$

$(O - E)^2 = 2.97^2 = 8.8209 = 8.82$ for every cell

$8.82 \div 38.03 = 0.23$, $8.82 \div 23.97 = 0.37$, $8.82 \div 53.97 = 0.16$, $8.82 \div 34.03 = 0.26$

$\chi^2 = \Sigma (O - E)^2/E = 0.23 + 0.37 + 0.16 + 0.26 = 1.02$

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(b) State, using the data, whether Jamie's results are significant for a two-tailed test at $P \leqslant 0.025$ where $df = 1$.

The formulae and statistical tables can be found at the front of the paper.

(1)

Not significant: the calculated value of 1.02 is less than the critical value of 5.02 (two-tailed, p ≤ 0.025, df = 1), so the null hypothesis is retained.

(c) Give **one** conclusion that Jamie could make from the data gathered from his investigation.

(1)

There is no difference in the level of obedience shown by males and females when given an instruction not to run on the platform.

(Total for Question 7 = 6 marks)

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8 Ling is investigating the impact of parenting styles on infant attachment. She has gathered nine peer-reviewed, published articles. The articles include in-depth, qualitative data from parents about their parenting styles and infant behaviours.

(a) Describe how Ling could use thematic analysis to analyse the qualitative data in the articles.

(2)

Ling could read through each of the nine articles several times, picking out words and phrases in the parents' accounts that relate to parenting style and infant attachment, and code them. She would then identify similar ideas that are commonly mentioned across the articles and group them into themes, eg "warm, responsive parenting" and "secure attachment", producing a summary of the links between parenting and attachment.

(b) Explain **one** improvement that Ling could make to her investigation.

(2)

Ling could use more than nine articles, for example gathering 20 peer-reviewed, published articles, to increase her sample size. This would increase the validity of her conclusions about the impact of parenting style on infant attachment, because the effect of any anomalous findings from a single article would be reduced.

(Total for Question 8 = 4 marks)

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9 Poppy is designing a laboratory experiment to test conformity to a majority group. She intends to replicate the procedure used by Asch (1951) for his research into conformity using lines. Poppy will increase the number of participants to three per experiment and the number of confederates to 10. Poppy has a total of nine participants, so plans to replicate her experiment three times.

Each experiment consists of 20 trials where the three participants have to state their answer for each slide. There are 20 different slides, each with three possible answers. In all trials, the 10 confederates will give the same, previously agreed, incorrect response.

Explain **three** control issues that Poppy would need to plan for when designing her laboratory experiment.

1 *Poppy must control demand characteristics so her participants do not guess that the aim is to test conformity to a majority group, eg by using a cover story about visual perception. This ensures construct validity, so the line answers measure conformity and are not skewed by participants changing their behaviour.*

2 *With 20 trials per experiment, order effects such as boredom may occur, so answers could reflect lack of interest rather than majority influence. Poppy could include distracter trials that differ from the line task to break up the monotony, improving the accuracy of her results about conformity.*

3 *As the experiment is replicated three times, Poppy must control extraneous variables, eg same room, slides, instructions and confederate script, so each replication is identical. This makes the three replications directly comparable, so her results can be checked across them and have stronger reliability.*

(Total for Question 9 = 6 marks)

TOTAL FOR SECTION C = 20 MARKS

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SECTION D

Answer the question. Write your answer in the space provided.

10 One key question for society is the implication for treating offenders if aggression is found to be a result of innate biological factors rather than choice.

Legal systems are often based on the idea that individuals have free will, so have acted out of choice, so we should punish them for their actions. Some biological theories suggest that aggression is innately determined, and actions may not be a choice, so treatments may be more appropriate for offenders.

In 1966 Charles Whitman randomly fired gun shots at people, killing a total of 16 and wounding 31 others. It was discovered he had a brain tumour that may have affected his amygdala, potentially resulting in an inability to control his emotions and actions.

Dabbs et al. (1995) studied 692 male prisoners and found high levels of testosterone in those who committed violent crimes, which could indicate a link between aggression and increased testosterone levels.

Discuss the key question of the implication for treating offenders if aggression is found to be a result of innate biological factors rather than choice. You should use concepts, theories and/or research studied in your psychology course.

You must make reference to the context in your answer.

(8)

Biological explanations suggest aggression can be innate. The amygdala is activated in stressful situations and initiates the fight or flight response, such as fear and anger, while the prefrontal cortex regulates social behaviour and inhibits the amygdala. Raine et al. (1997) found reduced activity in the prefrontal cortex of murderers using PET scans, suggesting they had less control over impulsive aggression. Charles Whitman's brain tumour may have affected his amygdala, so his inability to control his emotions and actions may have been caused by brain damage rather than a free choice to kill 16 people. If so, it could be argued that the legal system should offer treatment, such as removing a tumour, rather than simply punishing such offenders.

Hormones and genes may also determine aggression. Dabbs et al. (1995) found high levels of testosterone in the 692 male prisoners who committed violent crimes, and low-activity variants of the MAOA gene (the "warrior gene") have been linked to aggression, as in Brunner

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et al.'s (1993) study of a Dutch family. This suggests treatments such as hormone therapy or drugs to regulate testosterone or serotonin may reduce reoffending more effectively than prison, which does not change the biological cause.

However, biology does not remove responsibility. Although Whitman had a tumour, many people with similar tumours never kill, and he still killed 16 people and wounded 31, so the legal system may argue that offenders should be punished to protect society. Dabbs et al.'s (1995) findings are correlational, so high testosterone may be a result of violent prison environments rather than a cause, and environmental triggers can release testosterone. People have free will over whether to expose themselves to such triggers. The diathesis-stress view suggests biology only creates a predisposition, so offenders still make choices. There is also a risk that biological explanations are used as an excuse, or that labelling someone as innately violent leads to unfair, indefinite treatment.

Overall, if aggression is biologically caused, as may be the case for Whitman, treatment alongside the legal process is more appropriate and humane. However, as most aggression results from an interaction of biology and environment, a soft determinist approach of holding offenders responsible while offering treatment is most appropriate.

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QUESTION 11 BEGINS ON THE NEXT PAGE.

SECTION E

Answer the question. Write your answer in the space provided.

11 Assess how far psychological research can be considered ethical.

(20)

Research with humans must meet the BPS Code of Ethics and Conduct (2009), which is based on the principles of respect, competence, responsibility and integrity, so that participants are protected from mistreatment. Participants should give fully informed consent, should not be deceived, have the right to withdraw themselves and their data, must have their personal details kept confidential, should be debriefed and should not be caused distress or harm where an alternative method could be used. Children are also protected by UNCRC Article 36, which protects them from exploitation, including in research. Animal research is governed by the Animals (Scientific Procedures) Act 1986, which requires researchers to hold licences so that animals are well housed, well looked after and do not suffer unnecessarily, and researchers follow the 3Rs: replace, reduce and refine.

Some psychological research can be considered unethical because participants were harmed. Milgram (1963) caused participants extreme distress, with some sweating, trembling and having seizures, and used prods such as "you have no other choice, you must go on" which made withdrawal difficult. However, Milgram did debrief participants and 84% said they were glad to have taken part, and without this procedure he could not have explained obedience to authority, so the distress was arguably outweighed by the benefit to society. Similarly, Asch (1951) deceived participants about the aim and the role of the confederates, but this was necessary to obtain valid evidence about conformity, and the harm was small.

Case studies raise particular ethical issues. HM was studied over his lifetime without ever really giving fully informed consent, because his memory problems meant he could not remember agreeing to take part. However, the outcomes have given society a much better

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understanding of how human memory works. The case of Clive Wearing is widely published, so his true identity is known, which fails to protect the confidentiality of a vulnerable man with severe memory loss. Money's (1965) case of the Reimer twins is a more serious example, as one twin was raised as a girl for the benefit of the psychologist's research, which was probably not in the interest of the children and caused long-term harm.

Research with children has also breached ethics. Watson and Rayner (1920) conditioned Little Albert to fear a white rat and did not remove the fear, which was highly unethical as the knowledge gained could have been found in less harmful ways. Ainsworth's Strange Situation caused infants distress when their mother left the room, which could be seen as exploitative. In contrast, Bowlby (1944) studied maternal deprivation in juvenile thieves without creating any deprivation himself, showing that sensitive topics can be studied ethically without harm.

Animal research is more controversial. Harlow (1958) separated infant monkeys from their mothers, causing severe long-term harm to their emotional development, which would be seen as unethical today. Pavlov's research on salivation in dogs caused them distress through surgery, but can be considered ethical as animals are a suitable alternative when humans cannot be used. Rats have been used to study schizophrenia by causing brain lesions or dopamine imbalances, and this has led to successful drug treatments, so the benefit to humans may outweigh the cost to the animals. On the other hand, Skinner tried to train pigeons to guide missiles in World War II, which would have sent the animals to their deaths, although this was considered acceptable at the time, showing that judgements about ethics change over time.

Ethics must also be balanced against validity. Deception and lack of full information are sometimes needed to avoid demand characteristics, so a strictly ethical study may produce

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less valid findings. A cost-benefit analysis, such as Bateson's (1986) decision cube for animal research, helps judge whether the quality of the research and the benefit justify the suffering caused.

In conclusion, psychological research can largely be considered ethical today, because codes such as the BPS Code (2009) and the Animals (Scientific Procedures) Act 1986 protect participants and ethics committees review studies before they start. However, many classic studies, such as Watson and Rayner (1920), Money (1965) and Harlow (1958), were unethical by today's standards, and studies such as Milgram (1963) and HM are only justifiable because of their large benefits. So how far research is ethical depends on when it was carried out and on whether the benefits outweigh the costs.

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