Write your name here

Surname
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Other names

Pearson Edexcel
International Advanced Level

Centre Number

Candidate Number

Psychology

International Advanced Level
Paper 4: Clinical Psychology and Psychological Skills

Wednesday 14 June 2017 – Afternoon
Time: 2 hours

Paper Reference
WPS04/01

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.
- Check your answers if you have time at the end.

Turn over ▶

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FORMULAE AND STATISTICAL TABLES

Standard deviation (sample estimate)

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

Spearman's rank correlation coefficient

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

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 BEGINS ON THE NEXT PAGE.

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SECTION A

CLINICAL PSYCHOLOGY

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

1 Clinical psychologists define abnormality in a number of different ways. One of these definitions is the statistical infrequency definition.

(a) Describe how statistical infrequency would be used to diagnose a particular behaviour as abnormal.

(2)

The frequency of the behaviour in the general population is measured and plotted on a normal distribution curve. Anyone whose behaviour lies more than two standard deviations from the mean (the rarest few per cent of people) is classed as statistically abnormal.

(b) Explain **one** strength of using a statistical infrequency definition to make a diagnosis of abnormality in clinical psychology.

(2)

Statistical infrequency gives a clear, numerical cut-off point at which a diagnosis of abnormality is made. This removes clinician bias, so the diagnosis comes from an objective measure, which makes it more reliable because two clinicians using the same data would reach the same decision.

(c) Explain **one** weakness of using a statistical infrequency definition to make a diagnosis of abnormality in clinical psychology.

(2)

A fixed cut-off point ignores individual differences, and not every rare behaviour is undesirable (eg a very high IQ is rare). Also, someone who falls just inside the normal range, such as a person with mild but distressing depression, may not be diagnosed and so may not receive help even though they need it.

(Total for Question 1 = 6 marks)

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2 Carlos is a 24-year-old man who has been referred to a clinical psychologist after several incidents of being admitted to hospital for unusual behaviour. The clinical psychologist suspects that Carlos may be showing symptoms of schizophrenia.

(a) Identify **two** symptoms of schizophrenia that Carlos may experience.

(2)

1 *Carlos may have auditory hallucinations, hearing voices that do not exist, for example voices commenting on what he is doing.*

2 *Carlos may have delusions of persecution, believing that others are plotting to harm him, which could explain his unusual behaviour and hospital admissions.*

(b) The clinical psychologist believes the cause of Carlos' schizophrenia is an excess of the neurotransmitter dopamine. He decides to use drug therapy as a treatment for Carlos.

Explain **three** weaknesses of using drug therapy as a treatment for schizophrenia.

(6)

1 *Drug therapy, such as antipsychotics, works by blocking dopamine receptors in the brain. This assumes excess dopamine is the cause of Carlos' schizophrenia, but Gottesman's research suggests genetics play a role and environmental factors may also be involved, so the drugs may only treat the symptoms rather than the underlying cause.*

2 *Drugs do not work for all patients with schizophrenia. PET scans have shown that blocking dopamine does not work for patients who have had schizophrenia for more than 10 years, and drugs tend to reduce positive symptoms (eg hallucinations) more than negative symptoms, so many patients are left untreated.*

3 *Drug therapy ignores social causes. Social adversity explanations link schizophrenia to the environment, for example Eaton (1980) found it is associated with city life, so if Carlos is only given drugs, the stressors in his life remain and he is likely to relapse.*

(Total for Question 2 = 8 marks)

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3 Suzuki et al (2014) studied inpatients with schizophrenia.

(a) Describe how Suzuki et al (2014) sampled participants for their control group in this study.

(2)

The control group was a volunteer sample of people from the general population of Japan who did not have schizophrenia. They were matched to the inpatients on age and sex so that the two groups could be fairly compared.

(b) Suzuki et al (2014) concluded that the prevalence of underweight inpatients with schizophrenia was higher than in the general population of the country.

Describe how this conclusion can be used to improve the care of inpatients with schizophrenia.

(2)

The conclusion shows hospitals that they need to monitor inpatients' physical health, such as body weight and BMI, not just their mental health. They could improve the food service and meal times, eg extra or more nutritious meals, so underweight inpatients gain weight and become as physically healthy as the general population.

(c) Explain **two** reasons why the conclusion reached by Suzuki et al (2014) is not generalisable.

(4)

1 *All participants in the study were from Japan, so the study lacks population validity and the conclusion may not apply to inpatients with schizophrenia in other countries with different diets.*

2 *Health care systems differ between countries: inpatients with schizophrenia in Japan stay in hospital far longer than in Europe or North America, so their weight is not typical of patients elsewhere.*

(Total for Question 3 = 8 marks)

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4 A clinical psychology student conducted research using a closed questionnaire to investigate male and female perceptions of mental health. The student asked participants whether being diagnosed with anxiety disorder was more or less serious than being diagnosed with diabetes. The results are shown in **Table 1**.

	Anxiety disorder is more serious than diabetes	**Anxiety disorder is less serious than diabetes**
Males	11	34
Females	28	14

Table 1

(a) Calculate chi-squared for this data by completing **Table 2**.

Your answers should be correct to two decimal places.

(4)

		Observed	**Expected**	**O-E**	**$(O-E)^2$**	**$(O-E)^2/E$**
Males	**More serious**	11	20.17	−9.17	84.09	4.17
	Less serious	34	24.83	9.17	84.09	3.39
Females	**More serious**	28	18.83	9.17	84.09	4.47
	Less serious	14	23.17	−9.17	84.09	3.63
				chi-squared =		15.66

Table 2

Space for calculations

O − E: 11 − 20.17 = −9.17, 34 − 24.83 = 9.17, 28 − 18.83 = 9.17, 14 − 23.17 = −9.17

$(O - E)^2 = 9.17^2 = 84.0889 = 84.09$ (2 d.p.) for every cell

84.09 ÷ 20.17 = 4.17 84.09 ÷ 24.83 = 3.39

84.09 ÷ 18.83 = 4.47 84.09 ÷ 23.17 = 3.63

$\chi^2 = 4.17 + 3.39 + 4.47 + 3.63 = 15.66$

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(b) State the critical value for chi-squared, for this data, with df1 at p0.05 for a two-tailed test.

(1)

Critical value = 3.84

(c) Justify, with reference to the data, that there is a significant difference between male and female perceptions of mental health.

(1)

The calculated value of χ^2 = 15.66 is greater than the critical value of 3.84 (df = 1, p ≤ 0.05), so the difference between males and females is significant.

(Total for Question 4 = 6 marks)

5 Some psychologists argue that culture can have an impact on the diagnosis of abnormality in clinical psychology.

(a) Explain **one** reason why cultural issues may affect the diagnosis of abnormality.

(2)

Cultures view symptoms differently, so the same behaviour may be judged normal in one culture and abnormal in another. For example, Plains Indians may hear their dead relatives speak to them, which is normal and a spiritual blessing in their culture, but in North America this could be diagnosed as a hallucination and a symptom of schizophrenia.

(b) Explain **one** reason why cultural issues may not affect the diagnosis of abnormality.

(2)

Classification systems such as the DSM use clear, objective criteria that have been successfully used in many different countries. Lee (2006) found that using the DSM to diagnose ADHD in Korea was as valid as using it in the USA, so cultural differences did not affect the diagnosis.

(Total for Question 5 = 4 marks)

TOTAL FOR SECTION A = 32 MARKS

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SECTION B

6 In the past psychological abnormality has been viewed negatively. The therapies available for patients with mental health disorders could be cruel and invasive. Inpatients were often poorly treated, and once admitted into hospitals they stayed for lengthy periods of time. Some people believed that the patients were undeserving of care.

Care for patients with mental health disorders has now improved and often occurs within the community. Clinical psychologists may have to meet strict guidelines in their work and some will register with the Health and Care Professions Council (HCPC). Many people are now more accepting of mental health issues and psychological abnormality is often better diagnosed and treated by professionals.

Evaluate the suggestion that psychological abnormality is now better diagnosed, treated and accepted in society.

(16)

In the past, people with mental health disorders were often locked away in asylums such as 'Bedlam', where they were neglected, beaten and even put on display to the public. Today these institutions no longer exist and have been replaced by community care and specialist hospitals, such as Al Amal Psychiatric Hospital in Dubai. Chan (2001) and Korkeila et al (1998) provide evidence that mental health care is being deinstitutionalised, so patients are no longer segregated from society. This supports the claim that abnormality is treated better. However, Grob (1994) argues that many community care systems fail to meet patients' needs, so some patients end up homeless, suggesting treatment has not improved for everyone.

Diagnosis is now based on clinical criteria in classification systems such as the DSM and ICD, which list clear symptoms of disorders such as schizophrenia and unipolar depression. This reduces the chance that abnormality is explained by superstition such as possession by evil spirits, making diagnosis more objective and reliable. The discovery of biological causes, eg Alois Alzheimer (1906) explaining senility as brain deterioration, also reduced fear and stigma. However, Irmak (2014) suggests there are similarities between schizophrenia and demonic possession and that medical and religious healers should work together, showing

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misunderstanding of abnormality still exists in some places.

Diagnosis also reflects social norms. Homosexuality was removed from the DSM when society no longer saw it as a disorder, which shows understanding is flexible and has become more accepting. On the other hand, gender dysphoria has remained in the DSM, which labels people as psychologically abnormal when they may see their difference as physical, so their needs may not be recognised. Culture-bound syndromes such as taijin kyofusho, a Japanese anxiety about the body offending others, may not be recognised in other cultures, so some patients are still misunderstood.

Clinical psychologists registered with the HCPC must meet strict standards, which protects patients from neglect or mistreatment by professionals. However, the HCPC only governs professionals, not the public, so stigma and discrimination in society can still occur.

In conclusion, diagnosis and treatment are clearly better than in the past because they are more scientific and regulated, and acceptance has grown. However, cultural bias, failures in community care and continuing stigma mean abnormality is better, but not yet fully, diagnosed, treated and accepted.

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(Total for Question 6 = 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.

7 Schaffer and Emerson's (1964) study entitled 'The Glasgow Babies', aimed to discover the age at which attachments were formed and also how intense those attachments were. They conducted naturalistic observations of 60 babies in their own homes. They observed the babies every four weeks until they were 12 months old, and then revisited for a final observation when the babies were 18 months old. The mothers also kept a diary of their baby's behaviour. Schaffer and Emerson discovered that 87% of babies had formed multiple attachments by the time they were 18 months old.

(a) Justify why a naturalistic observation research method was used in this study.

(2)

Observing the babies in their own homes means they are in a familiar environment with their usual carers, so the behaviour seen is natural and valid. It is also more ethical, because it reduces the distress that may have been caused by observing the babies somewhere unfamiliar.

(b) Explain **one** weakness of using self-report data based on diary entries made by the mothers.

(2)

The mothers may have shown social desirability or demand characteristics, writing diary entries that portrayed themselves and their babies positively, eg underreporting distress at separation. This means the data may be flawed, reducing the validity of conclusions about when and how intensely attachments formed.

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(c) The mothers were also interviewed about how their babies reacted to separation. This was to classify the behaviour of the baby in relation to separation anxiety and stranger distress.

Give **two** open questions that could be used when interviewing the mothers in this study.

(2)

Question 1

If your baby is left alone in a room, how do they react?

Question 2

What happens to your baby's behaviour when a stranger is present?

(d) Tahseen is a student who is interested in attachment and relationships. She decides to use a questionnaire to investigate whether strong attachments in childhood can lead to strong relationships in adulthood. Tahseen is concerned about the ethical implications of conducting her research.

Explain **two** ways that Tahseen can make her research ethical.

(4)

1 *Tahseen should include a clear statement of the right to withdraw at the start of the questionnaire. Questions about parents and relationships could be upsetting, so participants will know they can stop at any time and have their data removed from the study.*

2 *The questionnaire should be anonymous, using participant numbers instead of names. This respects confidentiality, because Tahseen will not know whose responses are whose, so private details about participants' family relationships can never be linked to them.*

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(e) Tahseen used her questionnaire to ask 55 adults aged between 25 and 35 years old about their relationship with their parents and also their current adult attachment relationships. She analysed the results and categorised responses as a positive or negative relationship.

The results are shown in **Table 3**.

	Positive current adult attachment relationships	**Negative current adult attachment relationships**
Positive relationship with parents	16	6
Negative relationship with parents	8	25

Table 3

(i) Tahseen's sample included 24 females and 12 of these were classified as having negative relationships with their parents.

Calculate the number of **males** classified as having negative relationships with their parents.

(1)

21 males

Space for calculations

Negative relationship with parents = 8 + 25 = 33 people

Females with negative relationship = 12

Males = 33 − 12 = 21

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(ii) **Table 4** shows the number of males and females who Tahseen classified as having positive relationships with their parents.

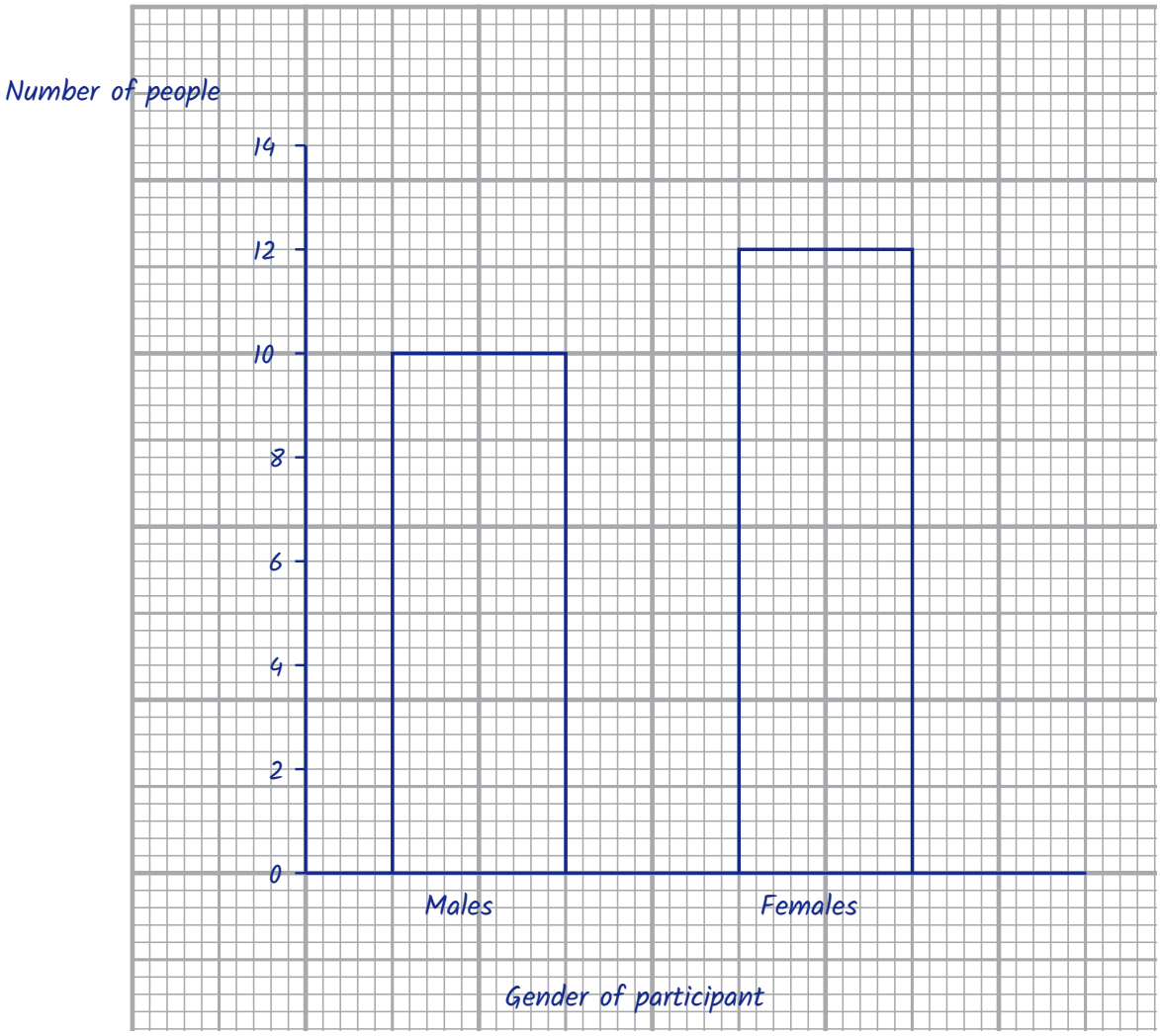
	Males	Females
Positive relationship with parents	10	12

Table 4

Draw a bar chart to illustrate the data in **Table 4**.

(3)

Title *A bar chart to show the number of males and females classified as having positive relationships with their parents*



(Total for Question 7 = 14 marks)

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8 Human memory is a topic studied by cognitive psychologists using laboratory experiments. Some cognitive psychologists claim that using laboratory experiments is more scientific than using case studies of brain damaged patients.

Justify the use of laboratory experiments to research human memory.

A laboratory experiment lets researchers control extraneous variables, eg preventing noise distraction in a test of short-term memory rehearsal, as in Peterson and Peterson (1959). This means they can be confident that changes in recall are caused by manipulating the IV, so the experiment has high internal validity and is a scientific way to establish cause and effect in memory.

Laboratory experiments use standardised procedures and instructions, such as reading identical word or digit lists to every participant at the same speed. This makes the study replicable, so the results can be retested and compared to check reliability, which is a key feature of science.

Case studies of brain damaged patients, such as HM or Clive Wearing, focus on unique individuals, so the findings lack generalisability. An experiment can use a larger, more representative sample of participants, increasing the generalisability of conclusions about memory to the wider population.

(Total for Question 8 = 6 marks)

TOTAL FOR SECTION C = 20 MARKS

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SECTION D

9 One key question for society is how individuals develop gender specific behaviours.

In 2005 research was conducted to investigate the impact of role models on students at a university. 39 male and 48 female students were given same-gender or different-gender role models in the career they were interested in. The impact on participant perceptions of themselves and identification with the role model were measured.

Female participants were more positively affected in same-gender role model conditions, and they identified more with the female role models. For the male participants, there was no significant difference in positive impact or identification in the same-gender or different-gender role model conditions.

The conclusion of the study was that a career role model of the same gender was important for female students, but this is not the case for male students.

Discuss the key question of how individuals develop gender specific behaviours. You should use concepts, theories and/or research studied in your psychology course.

You must make reference to the context in your answer.

(8)

Social learning theory (Bandura) suggests gender specific behaviours are learned by observing and imitating role models we identify with, especially those of the same gender, and by vicarious reinforcement. This explains why the female students were more positively affected by, and identified more with, female career role models: they saw a woman like them rewarded with a successful career, so they expect similar reinforcement and are motivated to copy her. Bandura et al (1961) support this, as children were more likely to imitate the aggression of a same-sex model.

However, the male students showed no significant difference between same-gender and different-gender role models, so the gender of the model was not important for everyone. This suggests identification depends on more than shared gender, eg the status or success of the model in the career. Women may also conform more to social expectations of supporting other women, which could explain the gender difference.

The psychodynamic approach (Freud) argues gender behaviour develops through resolving the

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Oedipus or Electra complex in the phallic stage, when the child identifies with the same-sex parent. The females may see the female role model as a maternal figure, so they identify with her more strongly. Some males may not have fully resolved the Oedipus complex, so they could identify with a female model as a maternal figure, explaining the lack of difference for males. However, this theory is unfalsifiable.

Biological explanations, such as prenatal testosterone, suggest some gender behaviours are innate, which the study cannot test. Overall, gender specific behaviours seem to develop through an interaction of biology and learning, with identification with role models more important for some groups, such as female students, than others.

(Total for Question 9 = 8 marks)

TOTAL FOR SECTION D = 8 MARKS

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SECTION E

10 A team of researchers tested whether there was a specific location in the brain where memory is stored. Instead of using human participants, the researchers taught rats how to find their way around a maze and then removed sections of the rats' brains. Despite removing brain tissue from almost every area of the brain, the rats were still able to complete the maze. The researchers were unable to locate a specific area of the brain that stored memories.

Criticisms of unethical practices with animals and humans have been dismissed by some researchers who claim that regardless of the actions taken during research, the outcomes are for the 'greater good' of society.

To what extent do the potential outcomes of human and animal research outweigh ethical responsibility?

You must make reference to the context in your answer.

(20)

Ethical responsibility in research is set out in guidelines. Research with humans must follow the BPS Code of Ethics and Conduct (2009), which requires respect, informed consent, the right to withdraw and protection from distress or harm. Animal research in the UK is governed by the Animals (Scientific Procedures) Act (1986), so animals must be given good living conditions, licensed researchers must justify any suffering, and the 3Rs (replace, reduce, refine) should be applied. The 'greater good' argument claims that the benefits of research to society can justify costs to participants.

In the context, the rats had sections of their brains deliberately removed, causing permanent harm. Some would argue this is more ethical than damaging a human brain to test memory, as it would be completely unacceptable to do this to people, and the study did add to psychological knowledge by suggesting that memory is spread across many areas of the brain rather than in one location. However, the researchers were unable to locate a memory store, so there was no conclusive outcome and the harm to the rats was not clearly outweighed by any benefit to the greater good. Also, there are case studies of humans with naturally occurring brain damage, such as HM, that could have been used instead, so the harm was arguably unnecessary. Rats also have much simpler brains than humans, so the

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generalisability of the findings to human memory is limited, which reduces the benefit further.

Some research suggests outcomes can outweigh ethical costs. Milgram (1963) caused participants great distress and deceived them, but without this he could not have explained obedience to authority, which has helped society understand events such as the Holocaust. Similarly, rats have been used to study schizophrenia by causing brain lesions or dopamine imbalances, leading to effective antipsychotic drugs, so the benefit to human patients has outweighed the costs to the animals. The case of HM was also ethically questionable because he could never give fully informed consent, as he could not remember being studied, yet the outcomes greatly improved our understanding of human memory.

However, other research shows outcomes do not always justify the harm. Harlow (1958) caused monkeys severe distress by separating them from their mothers, which many see as unnecessary cruelty, although it did raise public awareness of animal welfare. Watson and Rayner (1920) created a phobia in Little Albert and never removed it, which was highly unethical and could have been tested with animals instead. Skinner's attempt to train pigeons to guide missiles in World War II would have sent the animals to their deaths, showing that judgements about the greater good depend on the historical context.

Furthermore, valuable outcomes can be achieved ethically. Pavlov's research on salivation in dogs caused little distress yet led to systematic desensitisation, and Bowlby (1944) studied 44 juvenile thieves using existing cases, without creating any deprivation. This suggests researchers do not need to cause harm to reach useful conclusions, so the greater good argument can be used as an excuse for poor practice. It is also hard to predict the outcome of research before it is carried out, so harm is caused with no guarantee of benefit, as with

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the rats in this study.

In conclusion, the potential outcomes of research can sometimes outweigh ethical responsibility, but only when the benefit is large, likely and cannot be achieved in a less harmful way. Ethical guidelines and cost-benefit analysis are therefore essential. In the rat study the harm was severe and the outcome inconclusive, so here the outcome did not outweigh the ethical responsibility to the animals.

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(Total for Question 10 = 20 marks)

TOTAL FOR SECTION E = 20 MARKS
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