Please check the examination details below before entering your candidate information

Candidate surname	Other names
StemUp Model Solution	

Pearson Edexcel
International Advanced Level

Centre Number	Candidate Number

Friday 5 June 2020

Afternoon (Time: 2 hours)	Paper Reference **WPS04/01**

Psychology

International Advanced Level

Paper 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.
- 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.

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

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

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SECTION A

CLINICAL PSYCHOLOGY

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

1 An fMRI brain scanning technique can be used to investigate brain activity.

(a) Describe how an fMRI scan measures brain activity.

(2)

An fMRI scan measures changes in blood flow and blood oxygenation in the brain. Active neurons use more energy and oxygen, so oxygenated blood flows to them, and the scan detects this to show which areas of the brain are active during a task.

(b) Arthur is investigating the symptoms of schizophrenia.

Give **one** symptom of schizophrenia that Arthur could investigate.

(1)

Arthur could investigate auditory hallucinations, such as hearing voices that are not there.

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(c) Arthur samples ten patients with schizophrenia and a control group of ten non-schizophrenic people. Both groups completed a listening task during an fMRI brain scan.

A pre-recorded voice describing a fictional series of events was played to participants and their brain activity was measured.

Explain, in terms of reliability, **two** strengths of Arthur's investigation into symptoms of schizophrenia.

(4)

1 *The fMRI scan is an objective, scientific measure of how each participant's brain responds while they listen to the voice, so the interpretation of brain activity is less subjective and the findings are more reliable and could be replicated.*

2 *The pre-recorded voice is a standardised procedure, so every patient and control heard exactly the same verbal information in the same way. This gives internal reliability and reduces extraneous variables, such as differences in tone of voice, confounding the brain activity results.*

(d) Suggest **one** control Arthur could have put in place when selecting his sample of patients with schizophrenia.

(2)

Arthur could have controlled for hearing impairments by excluding any patients with hearing difficulties, because all of the participants needed to hear the pre-recorded voice being played during the fMRI scan.

(Total for Question 1 = 9 marks)

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2 Ruva has been diagnosed with schizophrenia. She is about to begin family therapy to help her cope with the impact of schizophrenia on her daily life.

Ruva's parents and her older brother will be attending the sessions with her as they are often worried about Ruva's behaviour. She has asked her cousin to attend as Ruva trusts her cousin's advice and she has often helped Ruva cope with her symptoms in the past.

(a) Describe how a family therapy session could be conducted with Ruva and her family.

(4)

A therapist would lead the session, starting by asking Ruva, her parents, her brother and her cousin questions to find out how the symptoms of schizophrenia affect Ruva and each of them in daily life. Each family member would be encouraged to contribute, for example Ruva's cousin could explain how she has helped Ruva cope with her symptoms in the past and how she feels about the diagnosis. The therapist would support Ruva's parents and brother to share their worries about Ruva's behaviour and would educate the family about schizophrenia, so they understand that her behaviour is caused by the disorder. The family would then agree on a course of action and solutions together, such as reducing criticism at home and agreeing the role her cousin will take when Ruva is struggling with her symptoms.

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(b) Explain **two** weaknesses of using family therapy to help Ruva cope with her schizophrenia.

(4)

1 *Family therapy may only help Ruva's family support her when she has symptoms rather than treat the cause, because it does not correct the dopamine imbalance in the brain that is thought to cause schizophrenia.*

2 *Ruva's parents, brother and cousin must all be engaged and positive about the therapy for it to help her feel supported, otherwise relapse may occur. Vaughn and Leff (1976) found a 48% relapse rate in patients returning to families high in expressed emotion, such as criticism and hostility.*

(Total for Question 2 = 8 marks)

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3 Laurel used a correlational research method to investigate whether there was a relationship between the severity of anorexia nervosa when patients also had a diagnosis of unipolar depression.

Laurel carried out a Spearman's rank test on her data. Her calculated value was 0.459 with N=26.

(a) State, using the data, whether Laurel's results are significant for a two-tailed test at $P \leq 0.10$.

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

(1)

Laurel's results are significant, because her calculated value of 0.459 is greater than the critical value of 0.331 for N = 26 (two-tailed, P ≤ 0.10).

(b) Identify the lowest probability level of significance for a two-tailed test that Laurel could use for her calculated value to be significant.

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

(1)

P ≤ 0.025 (critical value 0.457, and 0.459 ≥ 0.457)

(c) Explain **one** strength of Laurel using a correlational research method in her investigation.

(2)

Laurel can find out whether a relationship exists between the severity of anorexia nervosa and a comorbid diagnosis of unipolar depression before doing further research. This saves the time and expense of an experimental investigation that would be unnecessary if there is no relationship between the two disorders.

(Total for Question 3 = 4 marks)

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4 Analyse whether mental health diagnosis can be considered reliable and valid.

(6)

Diagnosis can be considered valid because the DSM and ICD have criterion validity, as both classification systems diagnose the same disorder in the same people. Andrews et al. (1999) found agreement in the diagnosis of depression, substance dependence and anxiety in 1500 people using the DSM-IV and ICD-10, so diagnosis is valid.

Diagnosis can also be considered reliable, because a person receives the same diagnosis from different clinicians. Brown et al. (2001) found that two independent interviews using the DSM-IV criteria resulted in the same diagnosis of anxiety and mood disorders in 362 outpatients, which shows strong inter-rater reliability of the diagnostic criteria.

Validity is high when the DSM criteria accurately represent the reality of the symptoms people experience. Kim-Cohen et al. (2005) assessed DSM-IV diagnosis of conduct disorder using several data collection methods, such as mother and teacher reports, and found the diagnosis was a valid representation of the children's experiences.

However, reliability has not always been high. Beck et al. (1962) found only 54% agreement between psychiatrists diagnosing the same patients, although the criteria in modern versions of the DSM are more clearly defined, so diagnosis is now more reliable and valid than in the past.

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(Total for Question 4 = 6 marks)

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5 In your studies of clinical psychology, you will have learned about one of the following mental health disorders:

- Anorexia nervosa
- Unipolar depression.

(a) Give **one** symptom and **one** feature of your chosen mental health disorder.

(2)

Chosen mental health disorder

Unipolar depression

Symptom

Diminished interest or pleasure in all, or almost all, activities for most of the day, nearly every day.

Feature

The rate of unipolar depression in women is about twice as high as in men.

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(b) Describe **one** biological explanation for your chosen mental health disorder.

(3)

The monoamine hypothesis explains unipolar depression as caused by underactivity of monoamine neurotransmitters such as serotonin. Low levels of serotonin in the synapses fail to regulate a person's mood and sleep effectively, leading to low mood and disturbed sleep. Low serotonin also leads to reduced norepinephrine, which is involved in regulating alertness and pleasure responses, which explains symptoms such as fatigue and a loss of interest and pleasure in activities.

(Total for Question 5 = 5 marks)

TOTAL FOR SECTION A = 32 MARKS

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SECTION B

CLINICAL PSYCHOLOGY

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

6 In your studies of unipolar depression **or** anorexia nervosa, you will have learned about one of the following contemporary studies in detail.

- Hans and Hiller (2013)
- Ma, Quinn and Liu (2014)
- Becker et al. (2002)
- Reichel et al. (2014).

Evaluate your chosen contemporary study.

(16)

Chosen study

Becker et al. (2002)

Becker et al. (2002) investigated the effect of the introduction of television on the eating attitudes and behaviours of adolescent girls in Nadroga, Fiji, a province with a very low prevalence of eating disorders and no television before mid-1995. A cross-sectional design compared two separate samples of ethnic Fijian secondary school girls: 63 girls (mean age 17.3) in 1995, weeks after television arrived, and 65 girls (mean age 16.9) in 1998, three years later. They completed the 26-item Eating Attitudes Test (EAT-26), including questions about binge eating and purging, and girls reporting these behaviours took part in a semi-structured interview. The percentage of girls scoring above 20 on the EAT-26 rose from 12.7% to 29.2%, and self-induced vomiting to control weight rose from 0% to 11.3%.

A strength is that Becker et al. used a natural experiment, so the introduction of television was a natural independent variable and they can be reasonably confident it influenced eating behaviour in Nadroga. Studying this naturally also avoided an ethical problem, because deliberately exposing girls to television to see if it caused disordered eating would be unethical as an experiment.

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However, the cross-sectional design means the 1995 and 1998 samples were different girls, so they were not directly comparable. Participant variables, such as differences in family background or body weight, may explain the rise in disordered eating rather than television, which reduces internal validity.

The samples of 63 and 65 girls are also small, so anomalies in the data would have a strong effect on the reliability of the results. In addition, only adolescent girls from one province were studied, so the findings cannot easily be generalised to boys, adults or other cultures. On the other hand, sampling adolescent girls is useful, because eating disorders are more common in females and often begin in adolescence, so this is the group most at risk.

The EAT-26 is a standardised measure that has been used consistently to assess eating behaviour, which gives it construct validity and means the study could be replicated to test reliability. However, it is self-report data, so the girls may have given socially desirable answers about binge eating and purging, which means the findings may not be valid. The interviews add validity, because they gave rich qualitative data on how television influenced each girl, for example wanting to look like the characters on screen. However, interview data can be subjective, as girls may perceive and explain their eating behaviour differently, and the researcher must interpret it, so it may be less reliable.

In conclusion, Becker et al. (2002) provides valuable evidence that the media can influence eating attitudes, and its natural setting gives it high ecological validity. However, because of the small, non-comparable samples and reliance on self-report, it shows a link between television and disordered eating rather than proving cause and effect.

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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 **Figure 1** shows a distribution curve.

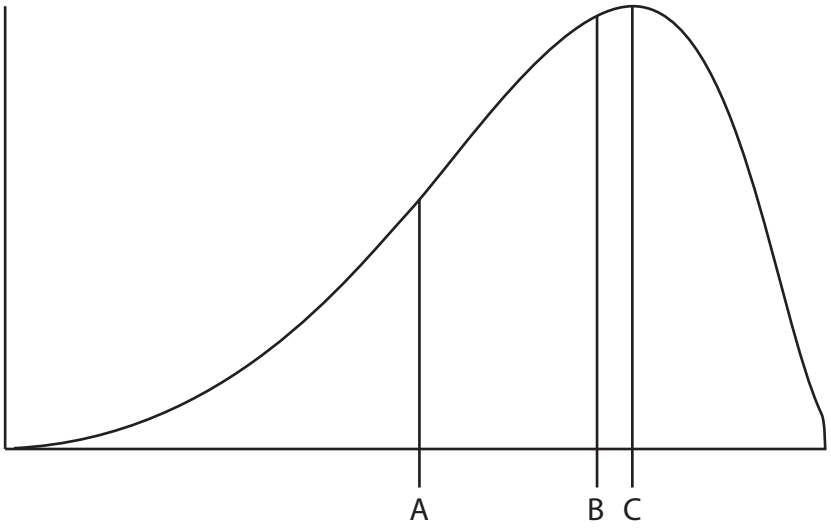


Figure 1

(a) Identify the measure of central tendency shown by **line C** in **Figure 1**.

(1)

The mode

(b) State the type of distribution shown in **Figure 1**.

(1)

Negatively skewed distribution

(Total for Question 7 = 2 marks)

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8 Spiros wants to investigate the influence of role models on the helping behaviour of 56 adolescent boys aged 13-years old. He asks two 16-year old males, who are both popular and well-liked students, to act as confederate role models.

Spiros will first observe how many of the 56 boys hold a door open for someone else when they enter a lecture hall for a lesson.

During the lecture, a confederate will hold a door open at the front of the lecture hall for another confederate to walk in. He will then repeat this when the confederate walks out of the lecture hall.

Spiros will then observe how many of the 56 boys hold a door open for someone else when they exit the lecture hall.

(a) Give a fully operationalised directional (one-tailed) hypothesis for the investigation by Spiros.

(2)

More 13-year-old boys will hold a door open for someone else when they exit the lecture hall, after observing the 16-year-old confederate role models holding a door open, than when they enter the lecture hall before observing the role models.

(b) Spiros found that 10 boys opened a door for someone else when they entered the lecture hall, and 11 boys opened a door for someone else when they exited the lecture hall.

Calculate the percentage of all boys who opened a door for someone else after observing the modelled behaviour.

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

(1)

Space for calculations

Boys who opened a door after the modelled behaviour = 11

11 ÷ 56 × 100 = 19.642857...%

= 19.643% (3 d.p.)

Percentage of boys who opened a door for someone else *19.643%*

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(c) State **one** conclusion that Spiros can make from his investigation.

(1)

Adolescent boys do not reproduce the helping behaviour of 16-year-old role models, as door opening only rose from 10 to 11 boys.

(d) Explain **one** way that Spiros could improve the validity of his investigation about the helping behaviour of adolescent boys.

(3)

Spiros could carry out a follow-up unstructured interview to gather qualitative data, asking the boys to explain why they did or did not hold the door open for another person after the lecture. This would give him a more in-depth understanding of the motivation behind the helping behaviour he observed, for example whether they had even noticed the confederates, so his conclusions would be more valid.

(Total for Question 8 = 7 marks)

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9 Analyse whether research with human participants in cognitive psychology meets the ethical requirements of the BPS Code of Ethics and Conduct (2009).

(6)

Some research in cognitive psychology meets the BPS Code of Ethics. Bartlett (1932) asked participants to recall the War of the Ghosts story, which would not be a stressful or upsetting task. This meets the BPS ethical requirements, as participants were unlikely to have been harmed or distressed by taking part.

However, case studies of brain-damaged patients involve vulnerable participants. HM was unable to make new long-term memories, so he would not remember agreeing to take part in the research. Therefore he could not give fully informed consent or exercise his right to withdraw, so this research does not fully meet BPS guidelines, although consent was given by others on his behalf.

Sacchi et al. (2007) used doctored photographs of real-life events, including the Tiananmen Square protests in Beijing where people were killed, which could be upsetting. Using pictures tries to minimise direct harm, but for participants who remembered the event the images could be distressing. Participants were also deceived about the photographs being altered, so the research attempted to follow ethical guidelines but may not fully meet them.

Overall, most cognitive research is low risk, but studies with vulnerable participants or deception meet the BPS code less fully.

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(Total for Question 9 = 6 marks)

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10 Khalid wanted to find out if cognitive ability was affected by the time of day. He investigated whether participants could complete mathematical calculations better in the morning or in the afternoon. He used a volunteer sample of ten mathematics students at university.

- Condition A: the participants were given 20 calculations to complete at 10:00 hrs. The number of correct answers was recorded.
- Condition B: the participants were given 20 calculations to complete at 16:00 hrs. The number of correct answers was recorded.

He used a Wilcoxon Signed Ranks test to find out if his results were significant.

(a) Calculate the T value for the data by completing **Table 1**.

The formula can be found at the front of the paper.

You **must** show your working out.

(4)

Participant	Condition A	Condition B	Difference	Ranked Difference
A	15	16	−1	3
B	18	19	−1	3
C	19	20	−1	3
D	20	19	+1	3
E	17	16	+1	3
F	16	14	+2	6
G	12	12	0	–
H	17	11	+6	9
I	16	19	−3	7.5
J	14	11	+3	7.5

Table 1

Space for calculations

Ignore G (difference 0), so N = 9. Differences of 1 share ranks 1 to 5 = 3

Sum of positive ranks = 3 + 3 + 6 + 9 + 7.5 = 28.5

Sum of negative ranks = 3 + 3 + 3 + 7.5 = 16.5

T = smaller total = 16.5

T value = 16.5

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(b) State, using the data, whether Khalid's results are significant for a one-tailed test at $P \leq 0.05$.

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

(1)

Khalid's results are not significant, because T = 16.5 is greater than the critical value of 8 for N = 9 (one-tailed, P ≤ 0.05), and T must be equal to or less than the critical value.

(Total for Question 10 = 5 marks)

TOTAL FOR SECTION C = 20 MARKS

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SECTION D

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

11 One key question for society is whether knowledge from social and cognitive psychology can help reduce prejudice.

Prejudice is when an individual makes a judgement about another individual or group of people based on preconceived ideas or stereotypical traits. This can result in the unfair treatment of groups or individuals in society.

Tajfel (1970) found that boys in his study developed in-group favouritism towards their own group, even though the boys did not know who was in the other group. He suggested that when the boys were categorised into a social group they identified as part of that group, then compared themselves more favourably to the other group. They saw the other social group as an out-group.

Allport and Postman (1947) showed participants a picture of an argument between a 'white' character who was holding a razor and a character of 'other-race'. Participants then recalled this picture by describing it to another participant. Over half the participants distorted the story on recall, remembering the 'other-race' character as holding the razor.

(Source: adapted from Allport and Postman, 1947)

Discuss the key question of whether knowledge from social and cognitive psychology can help reduce prejudice. 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 identity theory, which came from Tajfel's (1970) research, explains that people categorise themselves into social groups, identify with their in-group and then compare it favourably with an out-group to boost self-esteem. In the context, the boys showed in-group favouritism even though they did not know who was in the other group, which suggests prejudice can arise simply from categorisation. This knowledge can help reduce prejudice, because if people are recategorised into one shared group, the "them and us" comparison is removed. Sherif (1954) found that hostility between two groups of boys at Robbers Cave was reduced when they worked together on superordinate goals, such as fixing the water supply.

Social psychology also shows that authority figures and minorities can change behaviour. Milgram showed people obey a legitimate authority figure, so a respected leader, such as a teacher, could

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encourage less prejudiced views of out-groups. Minority influence suggests one person who consistently expresses positive views of the out-group could reduce in-group favouritism like that shown by Tajfel's boys. However, prejudice is often supported by group norms and conformity, so individuals may be reluctant to challenge their in-group.

Cognitive psychology explains that memory is reconstructive and guided by schemas. In the context, over half of Allport and Postman's participants remembered the "other-race" character holding the razor, because their stereotyped schema distorted their recall to fit their expectations. Schemas can change through assimilation of new information, so exposure to non-prejudiced information and positive experiences of other ethnic groups could become part of the schema and reduce prejudice. However, schemas develop over a lifetime and each person has individual experiences, so a prejudiced schema may be difficult to change quickly.

In conclusion, social and cognitive psychology can help reduce prejudice by explaining how it arises and suggesting interventions such as cooperation on shared goals and new information, but long-held schemas and group norms mean these will only reduce, rather than remove, prejudice.

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SECTION E

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

12 Evaluate whether nurture is more important than nature in human behaviour.

(20)

Nature refers to the innate, inherited aspects of a person that they are born with, such as genes, brain structure and the endocrine system in hormone production. Nurture refers to the environment, interactions and experiences a person has over their lifetime. The debate concerns which has the greater influence on human behaviour.

Learning theories argue that nurture is more important. Bandura, Ross and Ross (1961) found that children who observed an aggressive role model hitting a Bobo doll imitated the aggression they observed, suggesting that violence and aggression are learned behaviours. Bartlett's (1932) theory of reconstructive memory shows that recall is interpreted through schemas based on prior cultural experience, so nurture plays a significant role in memory. Psychodynamic explanations also focus on early childhood experiences. Freud's case study of Little Hans suggested his phobia of horses came from his experiences with his father, and once the Oedipus complex was resolved the fear disappeared, so the phobia is attributed to nurture. However, Little Hans is a single case interpreted subjectively by Freud, so it is weak evidence and cannot be generalised.

Biological psychology argues that nature is more important. Raine et al. (1997) found differences in brain functioning, such as lower activity in the prefrontal cortex, in murderers pleading not guilty by reason of insanity compared with controls, suggesting violence results from brain functioning. Lindman et al. (1987) linked testosterone to aggression in males, so hormones play a role in violent behaviour. Evolutionary explanations claim behaviours such as aggression ensure strong genes are passed on, and Dobash and Dobash (1984) found violence against women often came from sexual jealousy, which could protect paternity. Olds and Milner (1954) found stimulating neural pathways in rats produced pleasure, suggesting reward is simply brain

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activation. However, biological explanations are reductionist, explaining behaviour through separate parts such as neurotransmitters, and fail to account for a holistic view of the person. Raine et al. also showed a correlation with brain activity, not that the brain differences were present from birth.

Much evidence shows nature and nurture interact, which challenges the idea that either is more important. Gottesman and Shields (1972) found a 58% concordance rate for schizophrenia in MZ twins, which supports genetic inheritance, but because it is not 100% there must also be environmental factors involved. The case of HM shows that memory depends on brain structure, as removal of his hippocampus caused amnesia, yet this was caused by an environmental process, surgery, that changed the brain. Bowlby (1944) argued that the need to attach to a caregiver is innate, but the quality and consistency of that attachment, such as maternal deprivation in his 44 juvenile thieves, determined behaviour into adulthood, so nurture is required. McDermott et al. (2009) found people with the MAOA-L gene were more aggressive, but mainly when highly provoked, so the gene needed an environmental trigger.

There are also methodological difficulties, because nature and nurture are difficult to isolate. Even twin studies cannot fully separate them, as MZ twins are often treated more similarly than DZ twins, so higher concordance may partly reflect shared environment.

In conclusion, nurture is not simply more important than nature. Its importance depends on the behaviour: learned behaviours such as imitated aggression and memory distortion are strongly shaped by nurture, while disorders such as schizophrenia have a clear genetic basis. The diathesis-stress view, where an inherited predisposition is triggered by the environment, best explains the evidence, so behaviour is the result of an interaction between nature and nurture.

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TOTAL FOR SECTION E = 20 MARKS
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