Please check the examination details below before entering your candidate information

Candidate surname	Other names
StemUp Model Solution	

Centre Number | Candidate Number

Pearson International Advanced Level

Time 2 hours

Paper reference **WPS02/01**

Psychology

International Advanced Subsidiary
PAPER 2: Biological Psychology, Learning Theories and Development

Calculators may be used.

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)

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

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

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

Biological Psychology

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

1 (a) State **one** area of the brain that influences human aggression.

(1)

The prefrontal cortex.

(b) Explain **two** weaknesses of brain functioning as an explanation of aggression.

(4)

1 *It is reductionist, as it ignores other factors that may cause aggression, such as social learning theory, which states that aggression is learned by observing and then imitating role models rather than being caused by how the brain functions.*

2 *A lot of the research is carried out on animals, which may not be true for humans, as humans rarely show predatory aggression unlike animals such as cats, so humans may not be aggressive in the same situations and the results may not generalise.*

(Total for Question 1 = 5 marks)

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2 Estelle conducted an investigation to see if there was a difference in the number of aggressive thoughts males and females had. She gathered participants from a local healthcare centre to take part in her study. Estelle asked her participants to record the average number of aggressive thoughts they had in a day.

(a) Describe how Estelle may have used a volunteer sampling technique to gather her participants.

(2)

Estelle could have put up a poster in the local healthcare centre asking for male and female participants for her investigation into aggressive thoughts. The poster would state when and where the participants should go if they wanted to take part.

(b) Explain **one** weakness of Estelle using a volunteer sampling technique in her investigation.

(2)

Only males and females who think they are not very aggressive may volunteer to take part, which means the results will be biased and not true of all males and females, as very aggressive people may not have taken part.

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Estelle's results for her male participants are shown in **Table 1**.

Participants	Average number of aggressive thoughts in a day
A	4
B	5
C	7
D	4
E	8
F	1

Table 1

(c) Calculate the median score for the number of aggressive thoughts in a day for males.

(1)

Space for calculations

In order: 1, 4, 4, 5, 7, 8

Median = (4 + 5) ÷ 2 = 4.5

Median score 4.5

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Estelle's results for female participants are shown in **Table 2**.

Participant	Average number of aggressive thoughts in a day	$(x - \bar{x})$	$(x - \bar{x})^2$
G	3	−0.33	0.11
H	5	1.67	2.79
I	2	−1.33	1.77
J	4	0.67	0.45
K	1	−2.33	5.43
L	5	1.67	2.79
Mean = 3.33		Sum of differences^2 =	13.34
		Standard deviation =	1.63

Table 2

(d) Calculate the standard deviation for the data gathered by Estelle by completing **Table 2**.

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

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

You **must** show your working out.

(4)

Space for calculations

$x - \bar{x}$: $3 - 3.33 = -0.33$, $5 - 3.33 = 1.67$, $2 - 3.33 = -1.33$,

$4 - 3.33 = 0.67$, $1 - 3.33 = -2.33$, $5 - 3.33 = 1.67$

Sum of $(x - \bar{x})^2 = 0.11 + 2.79 + 1.77 + 0.45 + 5.43 + 2.79 = 13.34$

$n - 1 = 6 - 1 = 5$, $13.34 \div 5 = 2.668 = 2.67$

$s = \sqrt{2.67} = 1.633...$ so standard deviation = 1.63 (2 d.p.)

(Total for Question 2 = 9 marks)

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3 In your studies of biological psychology, you will have learned about the study by Brendgen et al. (2005).

(a) Give **two** aims of Brendgen et al. (2005).

(2)

1 *To find out the extent to which social aggression could be explained by genetic factors, shared environmental factors or non-shared environmental factors.*

2 *To investigate to what extent the covariance between physical and social aggression could be explained by genetic, shared or non-shared environmental factors.*

(b) Explain **one** strength and **one** weakness of Brendgen et al. (2005) in terms of the sample used.

(4)

Strength

234 pairs of twins were used, which is a large sample size, so it may increase the representativeness of the results, as any anomalies in the aggression scores of individual twin pairs are less likely to have an effect on the overall results.

Weakness

The twins were all 6 years old, with an average age of 72.7 months, so the results may not be true for older children, especially as social aggression is not fully developed until about 8 years old, so they do not represent social aggression at a later age.

(Total for Question 3 = 6 marks)

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4 Nancy has just returned from a trip abroad. She is finding it hard to get to sleep at night as she does not feel tired. Nancy wants to go to sleep in the middle of the day as she is very tired, but cannot sleep as she is at work in an office.

Her eating habits have been affected, as she still wants a big meal in the morning, which would have been in the evening when she was abroad. She has not been out with her friends in the evening since she returned home, as she has felt too tired.

(a) Describe how external zeitgebers could help Nancy regulate her sleep wake cycle.

(4)

Light is the main external zeitgeber. Nancy should make sure her bedroom is dark at night, as darkness stimulates the pineal gland to produce melatonin, which will make her feel sleepy at the right time. When Nancy feels tired in the middle of the day she could go out for a walk at lunchtime to expose herself to sunlight, so the light stimulates her suprachiasmatic nucleus (SCN). While she is at work she should make sure there is plenty of bright light in the office, so the SCN detects that it is daytime and resets her 24-hour body clock, including the sleep wake cycle. Nancy should also change her eating so that she has her big meal in the evening rather than the morning, and go out with her friends in the evening, as these social cues will help reset her body clock to local time so she can sleep at night.

(b) Explain **one** strength of Nancy using external zeitgebers to regulate her sleep wake cycle.

(2)

Research such as Skene and Arendt (2007) shows that light is an important factor that could help Nancy regulate her sleep wake cycle after returning from abroad, as they found blind people with some perception of light had normal circadian rhythms, giving the use of zeitgebers credibility.

(Total for Question 4 = 6 marks)

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5 Assess the role of infradian rhythms in human behaviour.

(8)

Infradian rhythms are biological rhythms that last more than 24 hours. Two examples are the menstrual cycle and seasonal affective disorder (SAD). The menstrual cycle lasts about 28 days and begins with menstruation, when progesterone is low; levels of hormones such as oestrogen and progesterone change through the cycle and can affect female behaviour, for example around ovulation. SAD follows a yearly (twelve-month) cycle in which people become depressed during the winter months when there is less daylight. The lack of daylight causes more melatonin to be produced by the pineal gland, which makes the person feel more tired and low in mood throughout the winter.

There is evidence that infradian rhythms do affect behaviour. Guéguen (2012) found that women walked more slowly and more sexily in front of men when they were near ovulation, which shows the menstrual cycle affects how women behave, giving the explanation credibility. Penton-Voak et al. (1999) also found that women preferred more masculine male faces around ovulation, their most fertile time. Eastwood et al. (1985) found that people with affective disorders had a greater amplitude of periodicities in their infradian rhythms than a control group, which suggests infradian rhythms do affect our mood and are a valid explanation of some human behaviour.

However, infradian rhythms are not the only influence. Law (1983) found that significantly more females menstruated around the new moon than at other phases of the moon, which suggests infradian rhythms are themselves affected by external factors, so on their own they are not a valid explanation of all human behaviour. Yang et al. (2020) found that vegetarianism and higher alcohol consumption were associated with SAD, so SAD may not be due only to biological rhythms but also to diet and alcohol intake. The explanation is also

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reductionist, as it reduces mood and behaviour to hormones and light and ignores cognitive and social factors, and much of the evidence is correlational, so cause and effect cannot be established.

Overall, infradian rhythms do play a role in human behaviour, as there is consistent evidence that the menstrual cycle and seasonal changes affect behaviour and mood. However, their role is limited, as lifestyle and environmental factors also contribute, so an interactionist explanation combining biological rhythms with external factors is more complete.

(Total for Question 5 = 8 marks)

TOTAL FOR SECTION A = 34 MARKS

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SECTION B

Learning Theories and Development

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

6 Rose salivates when she smells fresh bread. Her grandma bakes a lot of fresh bread. Rose now salivates when she sees her grandma.

(a) Describe what is meant by the term 'neutral stimulus' in relation to Rose's behaviour.

(2)

A neutral stimulus is something that produces no reflexive response. When Rose originally saw her grandma, her grandma did not make her salivate. Rose only salivated at the sight of her grandma after her grandma had been repeatedly associated with the smell of fresh bread.

(b) Explain **one** strength of classical conditioning.

(2)

Watson and Rayner (1920) conditioned Little Albert to become scared of a white rat, giving the theory credibility, as it shows pairing a neutral stimulus (the rat) with a loud noise creates a new reflexive fear response, so classical conditioning can explain new reflexive behaviours.

(Total for Question 6 = 4 marks)

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7 Pip carried out a covert observation. He investigated whether children would imitate pro-social acts that were demonstrated by an adult. He went to a local school at a staff meeting and asked two teachers to help in his research.

Pip asked one teacher to help their class tidy up the books. He asked the other teacher not to help their class tidy up the books.

Pip observed the children in each class the next week. He tallied how many children tidied up the books for the teacher.

(a) Describe **one** ethical issue Pip may have considered when carrying out his observation.

(2)

As Pip is using children, he should get fully informed consent from their parents and from the head teacher of the school. This means he should tell them that he will be observing the children to see whether they help tidy up the books after watching their teacher.

(b) Pip used a chi-squared test on his data. He found a significant difference between the children who saw the teacher help tidy up the books and the children who did not see a teacher help tidy up the books.

Identify the critical value Pip used for a one-tailed (directional) test at $p \leqslant 0.01$ where $df = 1$.

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

(1)

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(c) Explain **one** strength of Pip using a covert observation.

(2)

The children would be less likely to show demand characteristics when deciding whether to help tidy up the books, as they would not know Pip was observing them, so their behaviour would be more natural, increasing the validity of the results on the effect of the teacher's behaviour.

(d) Explain **one** improvement Pip could make to his observation.

(2)

Pip could use the same teacher to help tidy up the books with one class and not help with the other class, so whether the children helped tidy up the books would not be affected by the personal characteristics of the two different teachers, which improves validity.

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(e) Pip also noted down any conversation the children had if they helped tidy up the books, gathering qualitative data.

Explain **one** strength and **one** weakness of Pip gathering qualitative data.

(4)

Strength

Pip would gain a more detailed understanding of why the children helped tidy up the books from their conversation, increasing validity, as he would note if a child who helped said something about the teacher, giving further evidence about the effect of the teacher's behaviour.

Weakness

Pip's analysis of the children's conversations would be based on his own interpretation, so it would be subjective. If a child said "she did it" Pip may think it referred to the teacher when another observer may not, which reduces the reliability of his observation.

(Total for Question 7 = 11 marks)

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8 In your studies of learning theories and development, you will have learned about one of the following contemporary studies in detail:

- Prot (2014)
- Bastian et al. (2011).

(a) Describe the results of your chosen contemporary study.

(3)

Chosen study *Prot et al. (2014)*

Prot et al. (2014) found that in all three groups (Western countries, Eastern European countries and East Asian countries) there was a positive link between the use of pro-social media and pro-social (helping) behaviour, and that pro-social media use was linked to higher empathy, which in turn was linked to more helping. This suggests the results generalise across cultures in terms of pro-social media use, empathy and pro-social behaviour. They also found that age had no effect on empathy or helping.

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(b) Explain **two** strengths of your chosen contemporary study.

(4)

1 *Prot et al. used an established scale to measure empathy, the empathic concern and perspective taking subscales of the Interpersonal Reactivity Index, which increases reliability, as other researchers can use the same scale to check the consistency of the results.*

2 *The sample was 2202 participants from seven different countries, giving a large and diverse sample, which increases the generalisability of the findings about pro-social media and pro-social behaviour, as the sample is more representative of the target population.*

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(c) Explain **two** improvements that could be made to your chosen contemporary study.

(4)

1 *Other measures of empathy and pro-social behaviour could be used instead of self-report questionnaires, such as observing participants to see how pro-social they actually are, which would increase validity, as objective data would be measured rather than subjective ratings.*

2 *Prot et al. could use a wider age range, including older adults and young children, which would increase the generalisability of the results, as they would show the effect of pro-social media across the full range of ages that watch and play such media.*

(Total for Question 8 = 11 marks)

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9 Lette is training to become a psychoanalyst. As part of her training, she has to conduct a case study about Bill who has relationship issues.

Bill has kept a diary of his dreams over the past month. He comes to regular appointments with Lette where he is encouraged to talk openly about anything he wants to talk about.

At the end of the case study Lette has to present her conclusions to a panel of experts.

Discuss how Lette could carry out her case study about Bill.

You must make reference to the context in your answer.

(8)

A case study is an in-depth investigation of one individual or a small group, gathering rich, detailed information, usually qualitative, over a period of time. Lette is carrying out her case study on one person, Bill, to find out why he has relationship issues. In psychoanalysis, a case study uses a variety of techniques, such as dream analysis and free association, to uncover unconscious thoughts and conflicts that Freud believed cause problems in adult life.

Lette could start by gathering background information about Bill through unstructured interviews, such as his childhood and his relationships with his parents, as Freud believed early experiences shape adult relationships. She would then use dream analysis with Bill's dream diary from the past month. Bill describes the manifest content, what he remembers happening in his dreams, and Lette interprets the latent content, the hidden meaning behind the symbols, as dreams are seen as the "royal road to the unconscious". Because Bill wrote his dreams down soon after waking, the diary gives qualitative data that is less affected by forgetting.

Lette would also use free association when Bill attends his regular appointments and is encouraged to talk openly about anything he wants. Bill should say whatever comes into his mind without censoring it, so his ego defences are lowered and unconscious material, such as feelings about a parent linked to his partner, can come through. Lette would note slips of the

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tongue and any resistance, such as Bill changing the subject when talking about relationships, as these may point to important unconscious conflicts.

To reach her conclusions for the panel of experts, Lette would triangulate the findings from the dream diary, free association and interviews, checking whether the same themes, such as a fear of rejection, appear consistently across methods. This increases the validity of her conclusions about how Bill's unconscious is affecting his relationships. However, her interpretations are subjective, so she could ask another trained psychoanalyst to analyse the same data to check inter-rater reliability before presenting. Lette must also keep Bill's identity confidential by using a pseudonym and gain his informed consent to present his case to the panel. Finally, as the case study is about one person, Lette should be careful not to generalise her conclusions beyond Bill.

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(Total for Question 9 = 8 marks)

TOTAL FOR SECTION B = 34 MARKS

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SECTION C

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

10 Evaluate **one** therapy, other than light therapy, that could be used for seasonal affective disorder.

(12)

Cognitive behavioural therapy (CBT) can be used for seasonal affective disorder (SAD). It is based on the idea that faulty, negative thoughts about winter lead to low mood and avoidance behaviour, so changing thoughts and behaviour will improve mood. The client has a number of weekly or twice-weekly sessions with a trained therapist, which may be in a group with other people who have SAD. In the first session the therapist establishes what the client hopes to achieve, such as being able to socialise with friends during the winter months.

The therapist then helps the client identify and challenge negative thoughts about winter and what they can do during it, such as "I can't do anything when it is dark". The client may be asked to provide evidence for these thoughts, or to take part in activities that would disprove them, and the negative thoughts are replaced with more positive, realistic ones that the client practises at home as homework. The behavioural part involves behavioural activation, where clients schedule and actively take part in enjoyable activities in winter, such as going outdoors in daylight or exercising, which reduces anxiety about the winter months.

There is evidence that CBT is effective. Rohan et al. (2015) found that CBT for SAD was more effective two winters after treatment than light therapy alone, with fewer recurrences, which suggests its effects are long-lasting. This is because the skills gained in CBT can be used in future winters, so clients do not need treatment every winter, unlike light therapy, which must be used daily each winter. CBT also has no physical side effects, unlike antidepressants, so it may be better for clients who are worried about taking medication.

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However, CBT has weaknesses. Meyerhoff et al. (2018) found that light therapy led to remission of early insomnia, psychic anxiety, hypersomnia and social withdrawal in less time than CBT, so CBT may be slower to relieve symptoms. CBT requires the client to be motivated to talk about their thought patterns and complete homework, but the depression caused by SAD can lower motivation and energy, so it may not be effective for everyone. It also focuses on current problems and does not address past issues that may have caused the onset of SAD. In addition, CBT is time-consuming and can be expensive, as it needs a trained therapist over many sessions.

Comparing CBT with other therapies, it treats the faulty thinking behind SAD rather than only the biological symptoms, which may explain its longer-lasting effects, while light therapy works more quickly. In conclusion, CBT is an effective therapy for SAD, especially in preventing the disorder returning in later winters, but because it is slower to work and depends on motivation, it may be most effective when combined with light therapy at first.

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(Total for Question 10 = 12 marks)

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11 Bob is 17 years old and has been involved in a fight with a group of boys from another area of the town he lives in. He and his friends have previously been attacked by the group of boys.

Bob punched one boy and kicked another boy. When the police arrived Bob and his friends ran away and were not caught. His friend praised Bob once they got away from the fight.

Belle had seen Bob fight and later that day asked Bob to go on a date with her.

Bob wants to go back to the area on another night to fight the boys again.

To what extent can hormones and operant conditioning explain Bob's aggression?

You must make reference to the context in your answer.

(16)

Hormones may explain aggression. In males, higher testosterone increases competitive responses, especially in relation to status and sex, leading to more aggression. Testosterone also increases activity in the amygdala and hypothalamus when in situations that could be seen as threatening, so the person is more likely to respond with aggression. Bob is 17, so his testosterone levels are likely to be high, and he may have fought the boys because he felt competitive and wanted to show his status, which then impressed Belle so that she asked him on a date. As Bob and his friends had previously been attacked by the group of boys, he may have seen the situation as threatening, so testosterone increased his amygdala response and he punched and kicked the boys. Cortisol is also involved: people with low cortisol have an under-aroused autonomic nervous system, so they may become aggressive to increase their arousal, which could explain why Bob wants to go back and fight again.

There is evidence for the hormonal explanation. Dabbs et al. (1987) found that testosterone levels were higher in male prisoners who had committed violent crimes than in those who had committed non-violent crimes, suggesting testosterone may explain aggressive behaviour. McBurnett et al. (2000) found that boys with lower levels of cortisol in their saliva were three times more aggressive than boys with higher levels, showing low cortisol may increase aggression. However, Dabbs et al. is correlational, so testosterone may not cause aggression.

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The reciprocal model suggests that aggression and winning competitions increase testosterone, so Bob's high testosterone could be a result of the fight rather than its cause. Hormones also cannot explain why Bob chose to fight these particular boys rather than anyone else, so they ignore the social context.

Operant conditioning explains aggression as learned through its consequences. Positive reinforcement is when a behaviour is followed by something pleasant, making it more likely to be repeated. Bob's friend praised him once they got away from the fight, and Belle asked him on a date; praise is a secondary reinforcer and the date with Belle could satisfy a basic need, acting as a primary reinforcer, so both explain why Bob wants to fight the boys again. Negative reinforcement is when a behaviour is repeated because something unpleasant is avoided or removed. Bob avoided being caught by the police by running away, and fighting may have removed the threat of being attacked again, so his aggression is reinforced. Because he was not punished, there is nothing to make the aggression less likely.

Skinner found that rats in a Skinner box that received food when they accidentally pushed a lever learned to push the lever more often, showing that behaviour can be learned through positive reinforcement, which can be applied to Bob's aggression. However, much of this research was carried out on animals, and humans have more complex cognitive processes, such as weighing up the risk of being caught, so operant conditioning may not fully explain aggression in humans. It also focuses only on nurture and ignores nature, such as the role of genes and hormones, so it is not a complete explanation. It also cannot explain why Bob was aggressive the first time, before any reinforcement, whereas hormones or social learning from his friends could explain this.

In conclusion, both explanations can explain Bob's aggression to some extent. Hormones such

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as testosterone and low cortisol may explain why a 17-year-old male like Bob is predisposed to react aggressively to a threatening group, while operant conditioning better explains why he wants to repeat the fight, as he was rewarded with praise and a date and avoided punishment. Neither is complete on its own, as hormonal evidence is largely correlational and operant conditioning relies on animal research, so the best explanation is an interactionist one, where Bob's biological predisposition is made more likely to lead to aggression by the reinforcement he received.

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(Total for Question 11 = 16 marks)

TOTAL FOR SECTION C = 28 MARKS
TOTAL FOR PAPER = 96 MARKS

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