Write your name here

Surname: StemUp Model Solution | Other names:

Pearson Edexcel
International Advanced Level

Centre Number | Candidate Number

Psychology

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

Thursday 19 October 2017 – Afternoon
Time: 2 hours

Paper Reference
WPS02/01

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.
- 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 Charong picked up a hot pan and dropped it on the floor.

Describe the role of the central nervous system when Charong dropped the hot pan.

Sensory neurons in the skin of Charong's hand detected the heat of the pan and sent the message to his spinal cord, which is part of his central nervous system (CNS). The spinal cord carried the message up to his brain, and his brain processed it as the pan burning his hand. A message was then sent back from his brain, down the spinal cord and through motor neurons to the muscles in his hand, so the muscles relaxed and Charong let go of the pan and dropped it. Relay neurons in his spinal cord can also pass the message straight to the motor neurons as a reflex, which is why he dropped the pan so quickly.

(Total for Question 1 = 3 marks)

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2 Adriana carried out a correlation to determine whether there was a relationship between sleep and aggression. She recorded the average number of hours sleep participants had per night in a week, and the number of aggressive acts they carried out in the same week.

The results for the number of hours sleep and number of aggressive acts are shown in **Table 1** below.

	Average number of hours sleep in a night	Rank 1	Number of aggressive acts in a week	Rank 2	d	d^2
A	8	4	3	3.5	0.5	0.25
B	10	8	5	6	-2	4
C	6.5	2	3	3.5	1.5	2.25
D	7	3	0	1	2	4
E	9	6.5	6	7	-0.5	0.25
F	8.5	5	4	5	0	0
G	5	1	2	2	-1	1
H	9	6.5	9	8	-1.5	2.25

Table 1

(a) Complete **Table 1** and calculate Spearman's Rank test between the average number of hours sleep in a night and the number of aggressive acts in a week.

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

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

(4)

Space for calculations

$\Sigma d^2 = 0.25 + 4 + 2.25 + 4 + 0.25 + 0 + 1 + 2.25 = 14$

$6\Sigma d^2 = 6 \times 14 = 84 \qquad n = 8, \quad n(n^2 - 1) = 8 \times 63 = 504$

$r_s = 1 - \frac{6\Sigma d^2}{n(n^2 - 1)} = 1 - \frac{84}{504} = 1 - 0.1667 = 0.8333$

$r_s = 0.83$ (2 d.p.)

Spearman's Rank test result ..... 0.83 .....

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(b) Explain **one** strength and **one** weakness of using the correlational research method.

(4)

Strength

Correlations are useful when researchers do not know whether there is a relationship between two variables, such as sleep and aggression. If a significant correlation is found, it can lead to new experimental research, for example manipulating the hours of sleep people get to see if this changes their aggression.

Weakness

Correlations cannot show cause and effect. Even if Adriana finds a relationship, she cannot be sure that less sleep causes aggression, as aggression may cause poor sleep, or another variable, such as stress, may affect both the hours of sleep and the number of aggressive acts.

(Total for Question 2 = 8 marks)

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3 Tariro has been fighting. His mother thinks that Tariro's aggression is genetic as his father and grandfather have both been in trouble with the police for fighting.

(a) Describe the role of genes in Tariro's aggression.

(3)

As both Tariro's father and grandfather have been in trouble for fighting, aggression seems to run in his family, suggesting Tariro may have inherited a gene that predisposes him to aggression at conception. One gene linked to aggression is the MAOA gene, which codes for the enzyme monoamine oxidase A that breaks down neurotransmitters such as serotonin. If Tariro has the low-activity variant of the MAOA gene (the "warrior gene"), he will not metabolise serotonin effectively, which is linked to low levels of serotonin in his brain. Low serotonin reduces impulse control, so Tariro is more likely to react aggressively when provoked, which explains why he has been fighting.

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(b) Explain **one** weakness of the role of genes in aggression.

(2)

The genetic explanation is reductionist, as it ignores the effect of the environment on aggression. Tariro may only have a genetic predisposition, and environmental factors could trigger the aggression, for example he may have learned to fight by observing and imitating his father as a role model, which the gene explanation cannot account for.

(Total for Question 3 = 5 marks)

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4 In your studies of biological psychology you will have studied the following classic study in detail:

- Raine et al. (1997).

(a) State **one** aim from the classic study by Raine et al. (1997).

(1)

To find out whether murderers pleading not guilty by reason of insanity (NGRI) had brain dysfunction, such as reduced activity in the prefrontal cortex, compared with non-murderers.

(b) Explain **one** improvement that could be made to the classic study by Raine et al. (1997).

(2)

Raine et al. (1997) could have included murderers who did not plead not guilty by reason of insanity, as well as those who did. This would make the sample more representative, so the findings about brain dysfunction could be generalised to all types of murderers, not just those claiming insanity.

(Total for Question 4 = 3 marks)

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5 Gabriella is conducting an experiment to see if there is a difference between the mathematical ability of males and females using a mathematics test. She uses a volunteer sampling technique to gain 30 participants, of which 15 are male and 15 are female. Her participants are all 11 years old and from the same school.

(a) Describe how Gabriella may have obtained her volunteer sample.

(2)

Gabriella could put a notice up in the school canteen or ask teachers to announce in class that she needs 11 year old students for a maths experiment. Any students who were interested would then sign up or go to the room stated on the notice, until she had 15 males and 15 females.

(b) Describe why Gabriella used a volunteer sample for her experiment.

(2)

Some of the 11 year olds may become anxious or stressed about taking a mathematics test. With a volunteer sample, only students who are happy to do the test put themselves forward, so Gabriella's experiment is more ethical. It is also quick and easy to recruit 30 students from one school this way.

(c) Explain **one** weakness of the volunteer sampling technique.

(2)

Volunteers tend to share characteristics, such as being keen to help or being confident at maths, so they are a biased sample. This means they may not represent the target population of 11 year olds, so the results about differences in maths ability may not be generalisable.

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(d) Identify **one** sampling technique other than volunteer sampling.

(1)

Random sampling.

(Total for Question 5 = 7 marks)

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6 Assess the importance of the role of internal pacemakers (body clock) in the regulation of sleep.

(8)

The main internal pacemaker (body clock) is the suprachiasmatic nucleus (SCN) in the hypothalamus. It is an endogenous pacemaker that keeps the sleep-wake cycle running on a roughly 24 hour (circadian) rhythm. Light detected by the retina is sent along the optic nerve to the SCN. When it gets dark, the SCN signals the pineal gland to produce melatonin, and the increase in melatonin makes a person feel sleepy. In the morning, light reduces melatonin production so the person wakes. The body clock also controls core body temperature, which is highest during the day, causing wakefulness, and falls at night, helping sleep.

Research supports the importance of the SCN. Ralph et al. (1990) transplanted the SCN from mutant hamsters with an abnormally short sleep-wake cycle into normal hamsters, and the recipients then showed the same short cycle as the donors. This shows the internal pacemaker directly controls the timing of sleep. Studies of people living in caves without daylight, such as Siffre, found they kept a fairly regular sleep-wake cycle of just over 24 hours, showing the body clock works even without external cues.

However, Ralph et al. used hamsters, and the human SCN may not work in exactly the same way, so the findings may not generalise to humans. Also, the cave studies show the cycle drifts away from 24 hours without light, which suggests exogenous zeitgebers such as light are needed to reset the body clock each day. Boivin et al. (1996) found that exposure to bright artificial light shifted participants' sleep-wake cycle by up to five hours, showing light also plays an important role in regulating sleep.

In conclusion, internal pacemakers are very important, as they generate the basic rhythm of sleep and wakefulness through the SCN and melatonin. However, they do not work alone; they are

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entrained by exogenous zeitgebers such as light, so sleep is best explained as an interaction between the internal body clock and external cues, which is why jet lag and shift work disrupt sleep.

(Total for Question 6 = 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.

7 Amelia had a troubled relationship with her parents as a child, and she is now receiving therapy/treatment for problems in her relationship with her husband.

Amelia's therapist offers therapy/treatment from the object relations school of thought.

(a) Describe the therapy/treatment Amelia's therapist would offer.

(4)

Amelia's therapist would explore how her troubled early relationships with her parents formed her personality, as object relations theory says we internalise our early relationships (objects) and repeat these patterns in adult relationships, such as with her husband. In sessions the therapist would observe how Amelia relates to him or her, for example if she becomes distrustful or dependent, as this shows how Amelia relates to other people (transference). The therapist would also monitor their own feelings in response to Amelia (countertransference), as this gives insight into how Amelia's husband may feel and respond to her. The therapist would then interpret and explain these patterns to Amelia, so she gains insight into them and can use this understanding to change how she relates to her husband and improve their relationship.

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(b) Explain **one** strength and **one** weakness of the object relations school of thought therapy/treatment.

(4)

Strength

The therapy allows Amelia to gain insight into the causes of her relationship problems, which lie in her childhood relationships with her parents, rather than just treating the symptoms. As the underlying cause is addressed, her problems with her husband are less likely to return after therapy ends.

Weakness

Object relations therapy can take a long time, often years, so it is expensive and may not be suitable for clients with problems that need to be dealt with quickly, such as addiction. Its interpretations are also subjective, so it is hard to measure scientifically whether the therapy is effective.

(Total for Question 7 = 8 marks)

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8 Mateo investigated gender stereotypes in advertisements. He decided to carry out a content analysis on advertisements that appear on television.

(a) Describe how Mateo may have carried out his content analysis.

(4)

First Mateo would operationalise what he means by gender stereotypes by creating behavioural categories, such as women advertising cleaning products, men shown as experts, or a male voiceover. He would then decide his sample of adverts, for example recording all adverts shown on one television channel between 7pm and 9pm for one week. While watching the recordings, he would use event sampling, making a mark on a tally chart every time a male or female character fits one of his categories. To check reliability, Mateo could watch the adverts twice to make sure his tallies are the same both times, or ask a second researcher to code them and compare the results for inter-rater reliability.

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Mateo analysed his results using the mode.

(b) State why Mateo used the mode to analyse his results.

(1)

Mateo collected nominal data, frequencies of males and females in each stereotype category, so the mode is the only appropriate measure of central tendency.

Mateo carried out a chi-square statistical test on his data due to the type of data he had collected.

(c) Give **two** reasons, other than the type of data, why Mateo used a chi-square statistical test.

(2)

1 *He was looking for a difference in the numbers of males and females shown in stereotyped ways.*

2 *He used an independent groups design, as each character was either male or female.*

(Total for Question 8 = 7 marks)

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9 In your studies of learning theories and development you will have studied one of the following contemporary studies in detail.

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

Chosen study

Bastian et al. (2011)

(a) State **one** aim from the contemporary study you have chosen.

(1)

To study whether playing violent video games would lead participants to see themselves, and their opponents, as less human.

(b) Explain **two** weaknesses of the contemporary study you have chosen.

(4)

1 *All the participants were undergraduate students who took part for course credit, so there may have been demand characteristics. The students may have felt they needed to give the results that were expected to gain their credit, reducing the validity of their ratings of their own humanness.*

2 *In study 1 the characters the participants played against were mainly non-human, which could be a confounding variable. It may have been fighting non-human characters, rather than the violence, that affected how human participants rated themselves, so the results lack validity.*

(Total for Question 9 = 5 marks)

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10 Naif carried out a participant observation. He was observing the behaviour of students in different classes to investigate whether they behaved differently for different teachers. Naif decided to do an overt observation.

(a) Describe how Naif could make his observation of the students overt.

(2)

Naif could ask each teacher to tell the class at the start of the lesson who he is and that he will be observing their behaviour. He could also tell the students at the end of a lesson that he will be observing them next lesson, and sit openly in the classroom with his tally chart.

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(b) Explain **one** strength and **one** weakness of the observational research method.

(4)

Strength

If observations are carried out in a natural setting, such as the students' normal classrooms, the behaviour observed is more likely to be normal. This means the results have high ecological validity, as they are an accurate representation of how participants behave in real life.

Weakness

Participants may change their behaviour if they know they are being observed, especially in an overt observation like Naif's. The students may behave better than usual, so the results are not an accurate representation of their normal behaviour, reducing validity.

(Total for Question 10 = 6 marks)

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11 Peter is 3 years old and his father is concerned about his safety near roads. He is worried Peter will be in an accident as he often runs into the road without looking to see if any vehicles are coming towards him. His father is trying to teach Peter to be more careful near roads.

Discuss, using operant conditioning, how Peter's father could teach him to be more careful near roads.

You **must** refer to the context in your answer.

(8)

Operant conditioning (Skinner) is learning through the consequences of behaviour. Behaviour that is reinforced is more likely to be repeated, and behaviour that is punished is less likely to be repeated. Peter's father needs to associate a reward with the desired behaviour of stopping at the kerb and looking for vehicles before crossing.

His father could use positive reinforcement, giving Peter something he wants every time he stops and looks for cars. This could be a primary reinforcer, such as a sweet, which satisfies a basic need, or a secondary reinforcer, such as a sticker or token, which Peter can exchange for his favourite drink or toy. Praise such as "well done for looking" would also reinforce the behaviour. As Peter is only 3, his father could use shaping, first rewarding him just for stopping at the kerb, then only for stopping and holding his father's hand, and finally only for looking both ways before crossing. He should reinforce Peter every time at first (continuous reinforcement) so he learns quickly, then switch to a variable schedule so the behaviour is less likely to become extinct.

His father could also use punishment. If Peter runs into the road, his father could remove something he likes, such as not letting him play with his friends that day (negative punishment), so running into the road becomes less likely. However, punishment only suppresses a behaviour and does not teach Peter what he should do instead, and it could make him fearful or anxious, so reinforcement is likely to be more effective.

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There are limitations. Peter is very young, so he may not understand why he is being rewarded, and the reward must be given immediately after looking for vehicles, or he may associate it with something else. Peter may also only look when his father is there to reward him, so the behaviour may not generalise to other situations. Also, his father cannot let Peter learn from the natural consequence of a car nearly hitting him, as this is too dangerous. Overall, positive reinforcement and shaping are the best ways for Peter's father to teach him to be careful near roads, especially if his father also models looking both ways himself.

(Total for Question 11 = 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.

12 Evaluate Freud's psychosexual stages of development.

(12)

Freud said that children develop through five psychosexual stages: oral (0 to 1 year), anal (1 to 3), phallic (3 to 6), latency (6 to puberty) and genital (puberty onwards). In each stage the libido is focused on a different part of the body. If a child receives too much or too little gratification at a stage, they become fixated, which affects their adult personality. For example, fixation in the oral stage can lead to a sarcastic, cynical or dependent personality, and fixation in the anal stage can lead to an anally retentive personality (obsessively tidy and stubborn) or an anally expulsive personality (messy and careless). In the phallic stage boys experience the Oedipus complex, desiring their mother and fearing their father, which is resolved by identifying with the same-sex parent, so the superego develops. Freud believed most of the mind is unconscious, and that we use defence mechanisms such as repression and denial to keep unacceptable thoughts in the unconscious, where they still affect our behaviour.

There is some evidence for the stages. Freud's case study of Little Hans (1909) found that Hans's fear of horses could be explained as an unconscious fear of his father, which supports the Oedipus complex in the phallic stage. O'Neill et al. (1992) found a positive correlation between anal personality traits and enjoyment of lavatorial humour, supporting the idea of anal fixation. Adams (1996) found that homophobic men were more aroused by images of gay men than non-homophobic men, supporting the idea of repression. The theory was also very influential, as it was one of the first to show the importance of early childhood experiences for adult personality, and it led to psychoanalysis as a therapy.

However, Little Hans was the only child Freud studied in detail, and much of the data was collected by Hans's father, who was a supporter of Freud, so it may be biased and is hard to

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generalise to all children. Hans's fear could also be explained by classical conditioning, as he had seen a horse fall in the street. The unconscious and fixations cannot be directly observed or measured, so the theory cannot be tested scientifically and cannot be falsified. Freud's theory also does not allow us to predict which children will become fixated or how this will affect their adult personality; instead it says that a person must have been fixated because they have that personality, which is a circular argument. The theory was also based on middle-class patients in Vienna, so it may be culturally biased, and it focuses mainly on boys, so it explains female development poorly.

In conclusion, Freud's psychosexual stages are important because they highlighted the role of childhood and the unconscious, and there is some supporting evidence. However, this evidence is limited, mostly from case studies and correlations, and the theory is unscientific and hard to test, so it should be treated with caution as an explanation of personality development.

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13 Evaluate the structure of the brain **and** social learning theory as explanations of aggression.

(16)

The biological explanation says the structure of the brain can cause aggression. The prefrontal cortex in the frontal lobe controls impulses and decision making, so if it is damaged or less active, people become more impulsive and anti-social and less able to control aggressive urges. The amygdala, part of the limbic system in the temporal lobe, helps regulate emotions such as fear and anger. If the amygdala is damaged or abnormal, a person may feel less fear and fail to regulate anger, which may increase violent behaviour.

Social learning theory (SLT) claims that aggression is learned through observation and imitation of role models. A role model is more likely to be imitated if the observer identifies with them, for example because they are the same gender or have high status. If the role model is vicariously reinforced, for example rewarded for being aggressive, the observer is more likely to imitate them. Imitation also depends on attention, retention, reproduction and motivation.

There is evidence for brain structure. Raine et al. (1997) used PET scans and found that murderers pleading not guilty by reason of insanity had lower activity in the prefrontal cortex and abnormal activity in the amygdala compared with controls. Williams et al. (2013) found that 60% of the 200 prisoners they surveyed had suffered some type of brain injury as a child. These findings are based on objective, scientific data from brain scans and are hard to dispute. However, they are correlational, so they cannot show that brain abnormalities cause aggression. Kreutzer et al. (1995) found that substance abuse, brain injury and crime were all related, but it could be that the head injury led to substance abuse, and the substance abuse led to the aggression. The biological explanation is also reductionist, as it ignores environmental influences such as upbringing.

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SLT is supported by Bandura, Ross and Ross (1961), who found that children who watched an adult model behave aggressively towards a Bobo doll imitated the aggressive acts, and boys imitated a male model more, showing the importance of identification. Bastian et al. (2011) found that playing violent video games led participants to see their opponents as less human, which could make aggression towards others more likely. However, Bandura's study was carried out on young children in a laboratory with a doll that is designed to be hit, so it lacks ecological validity and may not explain why adults are aggressive towards real people. Charlton et al. (2000) found that when television was introduced to St Helena, children's aggressive behaviour did not increase, which goes against SLT. SLT also cannot explain why some people who observe aggression do not become aggressive, which biological factors such as brain structure could explain.

Comparing the two, brain structure explains aggression scientifically and can explain sudden changes after injury, but it is deterministic and reductionist. SLT is better at explaining why aggression varies between cultures and families, but it ignores biology. Neither explanation considers Freud's view that aggression comes from an unconscious, dominant id.

In conclusion, both explanations have strong supporting evidence, but each only explains part of aggression. Brain structure may give some people a predisposition to aggression, and social learning may determine whether and how it is expressed, so an interactionist explanation combining both is the most complete.

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