



PE.SP4 Sport Psychology: Arousal and the Inverted-U Theory

AQA 8582 · Calculators not allowed · about 50 minutes

Total Marks

--

Name: _____ Date: ____ / ____ / ____

Answer ALL questions. Show all your working.

- 1 Arousal describes a performer's level of physical and mental readiness or excitement to perform.

- ☐ A) Arousal always improves performance the higher it gets
- ☐ B) Arousal always harms performance the higher it gets
- ☐ C) Performance is generally best at a moderate, optimal level of arousal, not at the extremes
- ☐ D) Arousal has no effect on sporting performance

(Total for Question 1 is 1 mark)

- 2 The inverted-U theory (Yerkes-Dodson law) describes the relationship between arousal and performance.

Figure (to be drawn): A line graph with arousal on the horizontal axis (low to high, left to right) and quality/level of performance on the vertical axis (low to high, bottom to top). The line rises from a low point at low arousal, up to a single peak at a moderate, optimal level of arousal roughly in the middle of the horizontal axis, then falls back down to a low point at high arousal, forming an upside-down U (inverted-U) shape. NOT accurately drawn.

Describe, in words, the shape of the graph produced when performance is plotted against arousal according to the inverted-U theory.

(Total for Question 2 is 2 marks)

- 3 State what is meant by 'optimal arousal'.

(Total for Question 3 is 1 mark)

- 4 State two symptoms a performer might show when their arousal is too high (over-aroused).

5 State two symptoms a performer might show when their arousal is too low (under-aroused).

(Total for Question 5 is 2 marks)

6 A key point of the inverted-U theory is that the optimal level of arousal is not the same for every skill.

Explain why a gross skill, such as a rugby scrum drive, and a fine skill, such as a golf putt, are likely to have different optimal levels of arousal.

(Total for Question 6 is 3 marks)

7 Oliwia is a weightlifter about to attempt a maximum deadlift. Callum is a snooker player about to attempt a long, precise pot.

(a) State whether Oliwia's deadlift or Callum's snooker shot is likely to have a higher optimal level of arousal. (1)

(b) Justify your answer to part (a). (2)

(Total for Question 7 is 3 marks)

8 Which of the following performers is showing signs of being over-aroused before competing?

- ☐ A) A sprinter who feels calm, focused and slightly excited before the race
- ☐ B) A footballer whose hands are shaking, whose muscles feel tight and who has rushed and misjudged two simple passes
- ☐ C) A swimmer who is fully warmed up and ready to race at the sound of the gun
- ☐ D) A gymnast who is calmly visualising their routine before performing

(Total for Question 8 is 1 mark)

- 9** Explain one way a coach could help an over-aroused performer bring their arousal level down closer to their optimum before a competition.

(Total for Question 9 is 2 marks)

- 10** Explain one way a coach could help an under-aroused performer raise their arousal level closer to their optimum before a competition.

(Total for Question 10 is 2 marks)

- 11** A netball goal shooter is taking a simple, unopposed shot close to the net during a friendly practice session with no crowd.
Suggest, giving a reason, whether this performer is more likely to be under-aroused, at their optimal arousal, or over-aroused.

(Total for Question 11 is 2 marks)

- 12** Discuss the inverted-U theory, referring to a named performer of your choice and a named sporting situation, explaining how the theory could be used to help that performer manage their arousal for optimal performance.

(Total for Question 12 is 6 marks)

- 13** State whether a beginner performer or an experienced, elite performer is more likely to be able to perform well at a slightly higher level of arousal in the same skill, and give a reason.

(Total for Question 13 is 2 marks)

- 14** Explain why a football penalty taker might experience a higher level of arousal in a penalty shoot-out to decide a cup final than in a penalty during a routine training session.

(Total for Question 14 is 3 marks)

- 15** If a performer's arousal rises past their optimal point during a match, state what is likely to happen to their performance next, according to the inverted-U theory.

(Total for Question 15 is 1 mark)

- 16** State one limitation of the inverted-U theory as a way of explaining the relationship between arousal and performance.

(Total for Question 16 is 2 marks)

- 17** State what is meant by the term 'arousal' in a sporting context.

(Total for Question 17 is 1 mark)

- 18** Which of the following would you expect to have the LOWEST optimal level of arousal?

- ☐ A) The release in archery
- ☐ B) A sprint start
- ☐ C) A rugby tackle
- ☐ D) A shot put throw

(Total for Question 18 is 1 mark)

- 19** A javelin thrower and a snooker player are both about to compete in major finals.
- (a) State and justify whether the javelin throw is likely to have a higher or lower optimal level of arousal than the snooker shot. (2)

- (b) Suggest what might happen to the snooker player's performance if their arousal rose to the same level that would suit the javelin thrower. (2)

(Total for Question 19 is 4 marks)

- 20** Explain why arousal-control techniques, such as controlled breathing, should be practised regularly in training rather than being tried for the first time in a major competition.

(Total for Question 20 is 2 marks)

- 21** State one named technique, other than breathing control, that a performer could use to lower their arousal before competing.

(Total for Question 21 is 1 mark)

- 22** Two performers have exactly the same heart rate and the same physical symptoms before a big match. One describes the feeling as 'exciting', the other describes it as 'terrifying'. Explain why the same physical level of arousal might affect these two performers' actual performance differently.

(Total for Question 22 is 2 marks)

- 23** A rugby coach gives the whole team an energetic, loud team talk immediately before kick-off, even though some players are naturally calm and others are naturally easily excitable. Explain one problem with using a single, identical method to manage arousal for an entire team rather than for each individual performer.

(Total for Question 23 is 3 marks)

Mark scheme · PE.SP4 Sport Psychology: Arousal and the Inverted-U Theory

Question 1

- **B1** C
- **Answer:** C

Question 2

- **B1** performance starts low at low arousal and rises as arousal increases, oe
- **B1** performance peaks at a moderate/optimal level of arousal, then falls again as arousal increases further, forming an upside-down U (inverted-U) shape, oe
- **Answer:** Performance starts low at low arousal, rises as arousal increases, peaks at a moderate, optimal level of arousal, and then falls again as arousal increases further, forming an upside-down U shape.

Question 3

- **B1** the ideal/best level of arousal for a performer to produce their best possible performance, oe
- **Answer:** The ideal level of arousal at which a performer produces their best possible performance.

Question 4

- **B1** any one of: increased muscle tension, narrowed/panicked attention, poor decision making, rushed technique, increased heart rate/sweating, oe
- **B1** a second, distinct symptom from the list above, oe
- **Answer:** For example, increased muscle tension and rushed, panicked decision making.

Question 5

- **B1** any one of: lack of concentration/focus, low motivation, sluggish/slow reactions, lack of effort, oe
- **B1** a second, distinct symptom from the list above, oe
- **Answer:** For example, lack of concentration and low motivation.

Question 6

- **B1** a gross skill like a scrum drive relies on strength/large muscle groups and does not need fine precision, so it can tolerate, or even benefit from, a higher level of arousal, oe
- **B1** a fine skill like a putt needs a high level of precision and fine muscle control, which is disrupted by muscle tension, so it needs a lower optimal level of arousal, oe
- **B1** this shows that 'optimal arousal' is not one fixed level for all performers/skills, but depends on the demands of the specific skill being performed, oe
- **Answer:** A gross skill such as a scrum drive relies on strength and large muscle groups rather than fine precision, so it can tolerate, or even benefit from, higher arousal; a fine skill such as a putt needs precise, small-muscle control, which extra muscle tension disrupts, so it needs a lower optimal level of arousal, showing that optimal arousal depends on the specific skill rather than being one fixed level for everyone.

Question 7

- (a) **B1** Oliwia's deadlift
- (a) **Answer:** Oliwia's deadlift.
- (b) **B1** a deadlift is a gross skill relying on maximum strength/large muscle groups, which is helped by high arousal, oe
- (b) **B1** a snooker shot is a fine skill needing precise, controlled small-muscle movement, which is disrupted by high arousal/muscle tension, oe
- (b) **Answer:** A deadlift is a gross, strength-based skill that benefits from high arousal, while a snooker shot is a fine, precision skill whose small-muscle control is disrupted by high arousal and muscle tension, so it needs a lower optimal level.

Question 8

- **B1** B
- **Answer:** B

Question 9

- **B1** a valid technique, e.g. deep/controlled breathing, progressive muscular relaxation, or positive self-talk, oe
- **B1** linked explanation of how it lowers arousal, e.g. slow breathing reduces heart rate and eases muscle tension, oe
- **Answer: For example, controlled deep breathing, which slows the heart rate and eases muscle tension, helping bring an over-aroused performer's arousal level back down towards their optimum.**

Question 10

- **B1** a valid technique, e.g. an energetic warm-up, upbeat music, or a motivational team talk, oe
- **B1** linked explanation of how it raises arousal, e.g. an energetic warm-up raises heart rate and increases mental readiness/focus, oe
- **Answer: For example, an energetic warm-up, which raises heart rate and increases mental readiness and focus, helping bring an under-aroused performer's arousal level up towards their optimum.**

Question 11

- **B1** likely to be under-aroused, oe
- **B1** reason: the low-pressure, unopposed, low-importance situation gives little to raise arousal, so motivation/focus could be low, oe
- **Answer: Likely to be under-aroused, because the low-pressure, unopposed, low-importance practice situation gives little to raise arousal, so the performer's motivation and focus could be lower than in a real competitive match.**

Question 12

- **Level 3** (5-6): A detailed and coherent response that accurately explains the inverted-U theory (including that optimal arousal differs by skill/performer) and applies it specifically to the named performer and situation, with a clear, sensible strategy for managing their arousal. Sustained, accurate use of sport psychology terminology.
- **Level 2** (3-4): Mostly accurate explanation of the inverted-U theory with some application to the named performer and situation, though the link between the theory and the specific example may be underdeveloped. Generally correct use of terminology.
- **Level 1** (1-2): Basic or generic statements about arousal and performance with little or no accurate reference to the inverted-U shape or specific application to the named example.
- **Level 0** (0): No relevant content.
- **Indicative content:**
 - Definition: the inverted-U theory states that performance improves as arousal increases, up to an optimal point, after which further increases in arousal cause performance to decline again, producing an upside-down U-shaped graph.
 - Optimal arousal is not fixed: it varies between performers and, importantly, between skills - gross/simple skills generally have a higher optimal arousal than fine/complex skills.
 - Application: correctly identifies whether the named performer's situation demands a fine or gross skill, and reasons about roughly where their optimal arousal should sit as a result.
 - Strategy if likely over-aroused: e.g. controlled breathing, relaxation techniques, positive self-talk, narrowing focus onto a simple process goal, to bring arousal down towards the optimum.
 - Strategy if likely under-aroused: e.g. an energetic warm-up, upbeat music, a motivational team talk, to raise arousal up towards the optimum.
 - Evaluative point: because the theory predicts a decline in performance on both sides of the peak, simply trying to maximise arousal (or minimise it) is not the correct strategy; the goal is always to move towards the performer's specific optimum, not towards one extreme.
 - Evaluative point/limitation: the theory is a simplified model; in reality other factors (personality type, experience level, and the performer's own anxiety/interpretation of arousal) also affect how a given arousal level is experienced, so the optimal point can shift for the same performer over time.

Question 13

- **B1** an experienced/elite performer, oe
- **B1** reason: with more practice/experience the skill becomes more automatic, so it is more resistant to the effects of higher arousal than a beginner's less secure technique, oe
- **Answer: An experienced or elite performer, because their technique is more practised and automatic, making it more resistant to the disruptive effects of higher arousal than a beginner's less secure, still-developing technique.**

Question 14

- **B1** the importance/consequence of the situation is much greater in the cup final (winning or losing the competition), oe
- **B1** there is likely to be a large crowd and greater pressure/expectation than in training, oe
- **B1** both factors raise the performer's perceived pressure, which increases their level of arousal, oe
- **Answer: The cup final carries far greater importance (the outcome decides the competition) and greater pressure from a large crowd and expectation than a routine training session, and both factors raise the performer's perceived pressure, which increases their level of arousal.**

Question 15

- **B1** performance will start to decline/get worse, oe
- **Answer: Their performance will start to decline.**

Question 16

- **B1** it treats optimal arousal as a single fixed point, oe
- **B1** when in reality the theory does not fully account for individual differences between performers (e.g. personality, experience) that can shift where that optimal point actually is, oe
- **Answer: It treats optimal arousal as a single fixed point on a graph, but does not fully account for individual differences between performers, such as personality or experience, which can shift where that optimal point actually is.**

Question 17

- **B1** a performer's level of physical and mental readiness/alertness/excitement to perform, oe
- **Answer: A performer's level of physical and mental readiness or excitement to perform.**

Question 18

- **B1** A
- **Answer: A**

Question 19

- (a) **B1** higher, oe
- (a) **B1** the javelin throw is a gross, explosive, strength-based skill, which can tolerate more arousal than the fine, precise control needed for a snooker shot, oe
- (a) **Answer: Higher, because the javelin throw is a gross, explosive, strength-based skill, which can tolerate more arousal than the fine, precise control a snooker shot needs.**
- (b) **B1** their performance would be likely to decline/suffer, oe
- (b) **B1** because that level of arousal is well past their own, lower optimal point, causing increased muscle tension that disrupts the fine control the shot needs, oe
- (b) **Answer: Their performance would be likely to decline, because that arousal level is well past the snooker player's own, lower optimal point, causing muscle tension that disrupts the fine control the shot needs.**

Question 20

- **B1** a technique that has been well-practised becomes more automatic/reliable, so it can be used effectively even under the pressure of competition, oe
- **B1** trying an unfamiliar technique for the first time under pressure is unlikely to work well and could even add to the performer's stress, oe
- **Answer: A well-practised technique becomes more automatic and reliable, so it can be used effectively even under competition pressure, whereas trying an unfamiliar technique for the first time under pressure is unlikely to work well and could even add to the performer's stress.**

Question 21

- **B1** any valid technique, e.g. progressive muscular relaxation, mental rehearsal/imagery, or positive self-talk, oe
- **Answer: For example, progressive muscular relaxation.**

Question 22

- **B1** how a performer interprets/labels their arousal (as positive excitement or as negative anxiety) affects the effect it has, not just the raw physical level itself, oe
- **B1** the performer who interprets it positively is more likely to perform well, while the one who interprets it negatively is more likely to be disrupted by it, even at the same physical arousal level, oe
- **Answer: How a performer interprets or labels their arousal, as positive excitement or as negative anxiety, affects the effect it has on their performance, not just the raw physical level itself; the performer who interprets it positively is more likely to perform well, while the one who interprets it negatively is more likely to be disrupted, even though their physical arousal is identical.**

Question 23

- **B1** different players are likely to have different optimal levels of arousal and different starting points before the talk, oe
- **B1** an energetic team talk could push an already excitable player past their optimal point (over-aroused), while it may correctly raise a naturally calm player towards theirs, oe
- **B1** so the same method can help some players and harm others at the same time, oe
- **Answer: Different players are likely to have different optimal levels of arousal and different starting points, so an energetic team talk could push an already excitable player past their optimal point into over-arousal, while correctly raising a naturally calm player towards theirs, meaning the same method can help some players and harm others at the same time.**