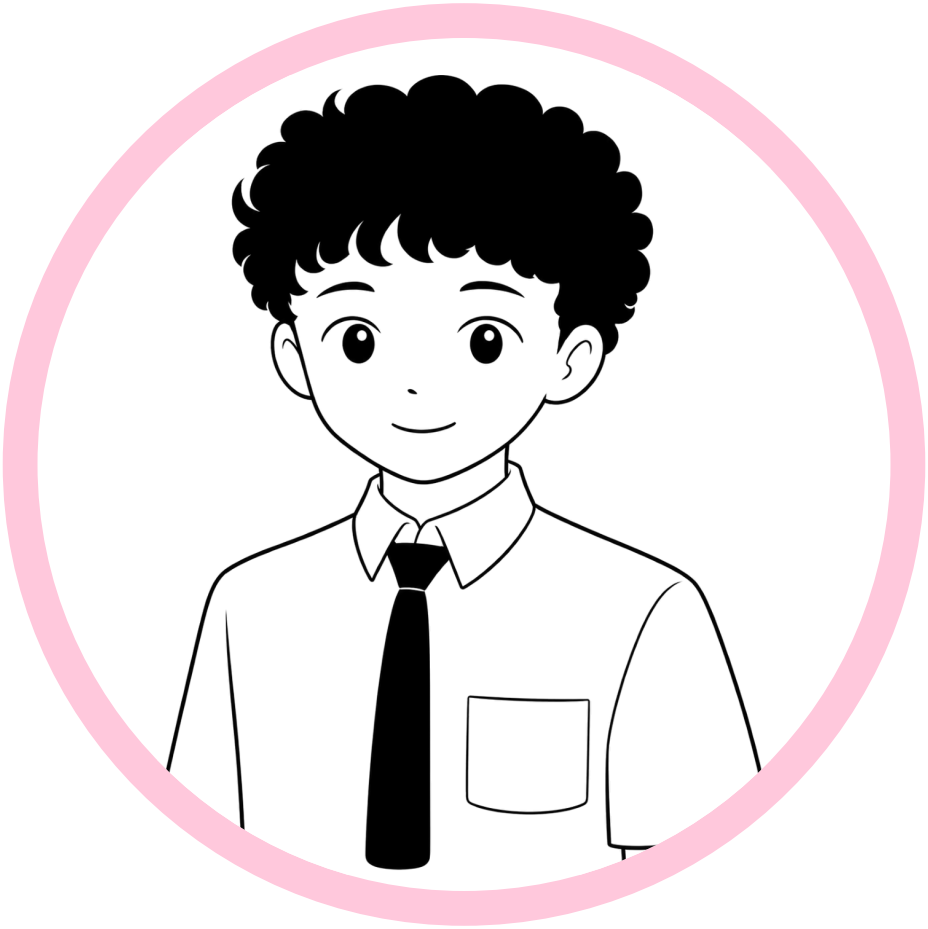
AQA A-LEVEL PSYCHOLOGY · 7182

PSYCHOLOGY



MARK SCHEME

3.3.8 BIOLOGICAL MECHANISMS IN AGGRESSION

SCORE	PERCENTAGE
/66	%

STEMUP

These questions belong to AQA, not to us.

The examination questions, mark schemes and examiner reports in this pack were written and published by AQA. They are past assessment materials, reproduced here so that students can revise from them.

What we do not own

STEMUP is not affiliated with AQA and does not own, and makes no claim to own, any of the question, mark scheme or examiner report material in this pack. AQA has not endorsed, approved or been involved in the production of it. AQA and the qualification titles used here belong to their respective owners and appear for identification only.

Where to find the originals

AQA publishes its past papers, mark schemes and examiner reports free of charge. Always check the current specification at aqa.org.uk before you revise, because content and wording can change between series.

If you hold the rights to any material in this pack and would like it amended or removed, contact admin@stemup.co.uk and we will act on it.

Q1.

[AO1 = 2]

1 mark for each correct letter:

B

E

[2]

Q2.

[AO1 = 2 AO3 = 2]

Level	Marks	Description
2	3 – 4	Findings are clear and accurate. Evaluation is clear and coherent.
1	1 – 2	Findings are clear but there is no evaluation, or, findings and evaluation are both incomplete / partly accurate. For 1 mark there is some detail of findings but no evaluation.
	0	No relevant content.

Possible findings:

- outline of findings of any study of genetic factors and aggression, eg family studies on the MAOA gene
- non-human animal studies, eg breeding aggressive dogs; gene knock-out studies in mice.

Any genetic study of aggression is acceptable but do not credit studies of the role of hormones.

Possible evaluation points:

- evaluation of findings, eg analysis of implication of findings; contradictory evidence
- alternative explanations; problem of demonstrating cause and effect
- methodological issues such as the validity of extrapolating from animals to humans.

Credit other relevant evaluation points.

Q3.

[O1 = 6 AO3 = 10]

Level	Marks	Description

STEMUP.CO.UK

4	13 – 16	Knowledge of genetic factors in aggression is accurate and generally well detailed. Discussion is thorough with effective use of evidence. The answer is clear, coherent and focused. Specialist terminology is used effectively. Minor detail and/or expansion of discussion sometimes lacking.
3	9 – 12	Knowledge of genetic factors in aggression is evident. There are occasional inaccuracies. Discussion is apparent with use of evidence mostly effective. The answer is mostly clear and organised. Specialist terminology is mostly used effectively. Lacks focus in places.
2	5 – 8	Some knowledge of genetic factors in aggression is present. Focus is mainly on description. Any discussion is only partly effective with some use of evidence. The answer lacks clarity, accuracy and organisation in places. Specialist terminology used inappropriately on occasions.
1	1 – 4	Knowledge of genetic factors in aggression is limited. Discussion is limited, poorly focused or absent, with little or no use of evidence. The answer as a whole lacks clarity, has many inaccuracies and is poorly organised. Specialist terminology either absent or inappropriately used.
	0	No relevant content.

Possible content:

- XYY genotype
- Genetic determination of testosterone levels
- The role of MAOA gene (linked to serotonin function in the brain)
- Genes for dopaminergic and serotonergic receptors

Discussion points:

- Research evidence to support the role of genetics – twin and family studies of genes and aggression eg MAOA gene; studies with non-human animals would also be relevant
- Problems of research into genes and aggression – defining aggression, confounding of environmental and genetic factors in family studies, many genes involved in aggressive behaviour.
- Evidence that challenges the role of genetics, such as hormones (testosterone) and social learning, though the focus should remain on discussion of the role of genetics

Credit other relevant material.

Q4.

[AO1 = 3 AO3 = 5]

Level	Marks	Description
4	7 – 8	Outline of the role of neural and/or hormonal mechanisms

STEMUP.CO.UK

		in aggression is accurate and generally well detailed. Evaluation is effective. The answer is clear, coherent and focused. Specialist terminology is used effectively. Minor detail and/or expansion of argument sometimes lacking.
3	5 – 6	Outline of the role of neural and/or hormonal mechanisms in aggression is evident. There are occasional inaccuracies. There is some effective evaluation. The answer is mostly clear and organised. Specialist terminology mostly used effectively.
2	3 – 4	Outline of the role of neural and/or hormonal mechanisms in aggression is present. Focus is mainly on description. Any evaluation is of limited effectiveness. The answer lacks clarity, accuracy and organisation in places. Specialist terminology used inappropriately on occasions.
1	1 – 2	Outline of the role of neural and/or hormonal mechanisms in aggression is limited. Evaluation is limited, poorly focused or absent. The answer as a whole lacks clarity, has many inaccuracies and is poorly organised. Specialist terminology either absent or inappropriately used.
	0	No relevant content.

Possible content:

- Neural mechanisms – limbic model, amygdala/frontal lobes, role of neurotransmitters such as serotonin
- Hormonal mechanisms – eg testosterone, cortisol

Note that genetic factors are not relevant to this question, unless directly linked to neural mechanisms such as levels of serotonin and the MAOA gene.

Possible evaluation points

- Research findings from case studies, work with non-human animals, studies with institutionalised offenders
- Contradictory nature of research findings (eg raised or lowered levels of serotonin)
- Involvement of non-neural/hormonal factors – eg genetics, social learning
- Methodological issues eg problems in defining aggression
- Implications – eg for free will/determinism in relation to criminal behaviour

Credit other relevant material.

Q5.

Marks for this question: AO1 = 6, AO3 = 10

Level	Marks	Description

STEMUP.CO.UK

4	13 – 16	Knowledge is accurate and generally well detailed. Discussion / evaluation / application is thorough and effective. The answer is clear, coherent and focused. Specialist terminology is used effectively. Minor detail and / or expansion of argument sometimes lacking.
3	9 – 12	Knowledge is evident. There are occasional inaccuracies. Discussion / evaluation / application is apparent and mostly effective. The answer is mostly clear and organised. Specialist terminology is mostly used effectively. Lacks focus in places.
2	5 – 8	Some knowledge is present. Focus is mainly on description. Any discussion / evaluation / application is only partly effective. The answer lacks clarity, accuracy and organisation in places. Specialist terminology is used inappropriately on occasions.
1	1 – 4	Knowledge is limited. Discussion / evaluation / application is limited, poorly focused or absent. The answer as a whole lacks clarity, has many inaccuracies and is poorly organised. Specialist terminology either absent or inappropriately used.
	0	No relevant content.

Please note that although the content for this mark scheme remains the same, on most mark schemes for the new AQA Specification (Sept 2015 onwards) content appears as a bulleted list.

AO1

A number of such factors have been proposed over the years, including the XYY genotype, genes for dopaminergic and serotonergic receptors, and the MAOA gene. One complication in this area is that contradictory results implicate both increases and decreases in e.g. serotonin levels, in aggression. Examiners therefore need to be aware of such contradictions when assessing answers.

Genetic approaches often implicate neurotransmitters and an outline of these relationships would be part of genetic factors in aggression. Answers that focus only on neurotransmitters cannot earn marks in this question part, although if a general link between e.g. neurotransmitters and genetics is made, it need not be detailed for the full range of marks to be available. Similarly with hormones such as testosterone and cortisol.

Evolutionary explanations are part of the genetic approach, and as long as the focus is on genetic aspects of evolutionary explanations of aggressive behaviour, such answers can earn credit.

The question refers only to ‘aggressive behaviour’ and material relevant to both humans and non-human animals is therefore creditable.

AO3

Credit use of research evidence to establish the contribution of particular genetic factors to aggressive behavior including MZ / DZ twin and adoption studies

investigating genetic factors in aggressive behaviour, investigations of candidate genes such as MAOA, and breeding studies with non-human animals. There are a large number of accessible studies and a key feature will be the extent to which findings are appropriately interpreted and developed into a line of argument. Methodological evaluation of studies may only earn marks if the implications for the reliability / validity of findings in relation to genetic factors in aggression are explicit. It is therefore unlikely that e.g. ethical issues would earn discussion marks.

Commentary can include the complexity of aggressive behaviour and the likely interaction between genetic and environmental factors. Alternative explanations of aggression, such as hormones and social psychological approaches, may earn marks if used as part of sustained and effective evaluation of genetic mechanisms.

Other relevant discussion points could include reductionism. The genetic approach is as low a level of explanation as is possible and is highly reductionist. This does not mean that it is wrong, simply that by ignoring higher level influences such as social and cultural factors it may not provide a complete explanation of aggressive behaviour. Other relevant discussion may include the nature / nurture and the free will / determinism debate, gender differences, and socially sensitive research.

Q6.

Marks for this question: AO1 = 6, AO3 = 10

Level	Marks	Description
4	13 – 16	Knowledge is accurate and generally well detailed. Discussion / evaluation / application is thorough and effective. The answer is clear, coherent and focused. Specialist terminology is used effectively. Minor detail and / or expansion of argument sometimes lacking.
3	9 – 12	Knowledge is evident. There are occasional inaccuracies. Discussion / evaluation / application is apparent and mostly effective. The answer is mostly clear and organised. Specialist terminology is mostly used effectively. Lacks focus in places.
2	5 – 8	Some knowledge is present. Focus is mainly on description. Any discussion / evaluation / application is only partly effective. The answer lacks clarity, accuracy and organisation in places. Specialist terminology is used inappropriately on occasions.
1	1 – 4	Knowledge is limited. Discussion / evaluation / application is limited, poorly focused or absent. The answer as a whole lacks clarity, has many inaccuracies and is poorly organised. Specialist terminology either absent or inappropriately used.
	0	No relevant content.

Please note that although the content for this mark scheme remains the same, on most mark schemes for the new AQA Specification (Sept 2015 onwards) content appears as a bulleted list.

STEMUP.CO.UK

AO1

There is a long tradition of research into the neural (brain) and hormonal mechanisms underlying aggressive behaviour. Much of the early work was carried out on non-human animals, but over the last twenty years new technologies have allowed this to be extended into work with humans. Either approach is acceptable. Classic models such as the Papez-Maclean limbic theory involving structures such as the amygdala, septum, and hippocampus have been extended in order to account for conditions such as psychopathy and reactive aggression in humans; areas such as the amygdala, cingulate and prefrontal cortex have been implicated.

On the hormonal side most research has focused on the role of testosterone in human and animal aggression.

Candidates may introduce material on genetic factors in aggression. Such material cannot gain credit unless the implications for neural / hormonal mechanisms are explicit e.g. the association between genetic factors and levels of neurotransmitters such as serotonin and noradrenaline.

AO3

Discussion is likely to focus on research evidence from studies with humans and non-human animals, and the implications of findings. Relevant commentary could include the problems of defining aggression, the range of aggressive behaviours, and problems of extrapolating from animals to humans. Gender and cultural issues / reductionism / determinism and ethical issues etc could also be made relevant to this question.

Alternative approaches that focus on the role of aggression such as psychological, social, and cultural aspects, may be relevant if used as part of sustained and effective commentary on the role of neural and / or hormonal mechanisms.

Q7.

AO1 = 4

The study of genetic factors in aggression has largely focused on genetic abnormalities (eg the XYY karyotype) associated with increased aggression. There are also twin studies, particularly in relation to aggression in children, and breeding experiments with non-human animals. It would also be relevant (though not necessary) for candidates to consider the interaction between genes and the environment in aggression, as this illustrates the role of genetic factors.
This is a broad area, and examiners should be alert to a range of alternative approaches. Outline of the role of other factors in aggressive behaviour may earn credit if explicitly linked to genetic mechanisms, eg brain structures, hormone levels.

4 marks Outline is accurate and coherent.
3 – 2 marks Outline is limited, generally accurate and reasonably coherent.
1 mark Outline is weak and muddled.
0 marks

STEMUP.CO.UK

No credit

Q1.

Most students gained at least one mark for this question.

Q5.

The Aggression topic overall was the most popular, and there were many impressive answers to this question. Some students failed to access the range of AO1 marks, by not outlining genetic factors in aggressive behaviour. Better answers referred to the MAOA gene and the XYY genotype, and gave some indication of process, eg the link between MAOA and neurotransmitter levels. For AO2 / 3 there was a wealth of research evidence from both human and non-human animal studies. MZ / DZ twin studies were popular, but often the rationale was confused and sometimes inaccurate (see General Comments). If the link between MAOA and serotonin levels had been made, then research on serotonin and aggression could receive full credit, and this included some effective use of animal studies. Findings from adoption and familial transmission research were often used effectively.

General commentary included the complexity of aggressive behaviour and problems in measuring it, and IDA included gender differences and alternative approaches, eg social psychological. However, the most consistently effective IDA was the implications of genetic research into aggression for the free will / determinism debate. Better answers outlined this debate and brought out the implications for the legal profession and individual responsibility for aggressive behaviour. Other IDA, such as reductionism and cultural differences, tended to be rote learnt and often failed to demonstrate understanding.

Less successful students presented essays on neurotransmitters, hormones such as testosterone, and brain structures, without any link to genetic factors. Such answers did not receive marks.

Q6.

A popular topic with a number of extremely impressive answers. A few candidates did not distinguish between neural/hormonal and genetic mechanisms and presented answers on genetics that were not relevant to the question. Those candidates that could outline the link between the MAOA gene and monoamine / serotonin levels did earn credit. Most answers outlined the role of serotonin, dopamine and testosterone in aggression. Also mentioned were cortisol and noradrenaline. Neural mechanisms were less popular, but there some extremely impressive answers on the role of limbic mechanisms, amygdala and prefrontal cortex in aggressive behaviour.

Although most candidates could use research evidence effectively as AO2 / AO3, only a minority actually earned reasonable AO1 marks. These were awarded for a description of the role of neural / hormonal mechanisms in aggression, but usually this consisted simply of naming a hormone or part of the brain. There needed to be some elaboration for reasonable AO1 marks for example the origins and general role of testosterone, or an outline of the structures that make up the limbic system and their involvement in behaviour.

Evaluation was usually through research evidence and often effective, with many candidates able to bring together findings from several studies. It was a common comment that findings from non-human animals could not generalised to humans. They can, of course, with caution, and it is particularly impressive if a range of findings in different species is consistent.

STEMUP.CO.UK

Q7.

There were a range of answers to this question. The XYY karyotype was popular and credit-worthy, although many went on to mention that recent evidence puts doubt on its relation to aggression. More convincing material covered studies with MZ / DZ twins, and breeding experiments with dogs and rats. At the top end candidates referred to genetic control of neurotransmitter levels and hormones such as testosterone. However a common error was simply to describe the role of neurotransmitters and hormones without reference to any genetic involvement; levels of these chemicals can vary with non-genetic factors. Some candidates wrote far too much given the limited number of marks available.

STEMUP.CO.UK