6.2 Applying Nature-Nurture and Gene-Environment Interaction to Biopsychology: 10-minute Pack

AQA 7182 · about 10 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions.

1 Identify the gene-environment interaction when practice affects brain only in carriers of a facilitating gene.

(Total for Question 1 is 3 marks)

2 Apply epigenetics to critique a claim that a drug 'corrects' genetic abnormality by ignoring environment.

(Total for Question 2 is 3 marks)

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Mark scheme · 6.2 Applying Nature-Nurture and Gene-Environment Interaction to Biopsychology: 10-minute Pack

Question 1

identifies gene-environment interaction, specifically a gene-by-environment (GxE) interaction where environment effect depends on genotype cao	**M1**
explains that the environmental input (navigational practice) produced structural brain change only in those with the facilitating gene, showing the effect of practice is moderated by genotype oe	**A1**
concludes this supports interactionism because neither gene nor practice alone fully determines the outcome, their combination does oe	**A1**

Answer: This is a gene-by-environment interaction: the effect of navigational practice on hippocampal volume depends on genotype. It supports interactionism because both the facilitating gene and practice are required to produce larger hippocampal volume.

Question 2

identifies that epigenetic marks can alter gene expression independently of DNA sequence, so receptor expression may be influenced by environment oe	**M1**
applies to critique: the drug may change protein levels short term but persistent epigenetic modifications from stress or learning could continue to alter expression, limiting the drug's effectiveness oe	**A1**
adds that biopsychological interventions addressing environmental triggers or stressors may be needed alongside pharmacological treatment oe	**A1**

Answer: Epigenetic modifications from environmental experiences can alter receptor expression independently of sequence. A drug that raises receptor levels may be limited if persistent epigenetic changes from stress continue to suppress expression, so environmental interventions may also be needed.

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