

1.1 Interaction of Heredity and Environment

Name: _____ Class: _____ Date: _____

Total: 10 marks

KEY WORDS environment 环境 • heritability 遗传率 • twin 双生子 • nature-nurture 先天与后天
• adoption 收养

Objective

Build the skills to answer exam questions on **heredity** 遗传 and **environment** 环境.

You must be able to:

- state what the **nature-nurture** 先天与后天 question actually asks
- explain what **twin** 双生子 and **adoption** 收养 studies are designed to separate
- define **heritability** 遗传率 and say what it does **not** mean
- describe how the **evolutionary** 进化 perspective explains a behaviour

1 Worked examples

Study these first. Each one shows the method for a task used later.

■ What nature-nurture asks

It does not ask whether heredity or environment causes a trait. Both always contribute. It asks how much of the **variation between people** in a population comes from each source, and how the two **interact**.

■ Why twin and adoption studies exist

Identical twins share nearly all their genes; **fraternal twins** share about half. Twins raised apart share genes but not environment; adopted children share environment but not genes with their adoptive family. Comparing these groups separates the two influences that ordinary families confound.

■ Heritability, precisely

Heritability is the proportion of the **variation in a trait within a population** attributable to genetic differences. It is a statement about a population, not an individual, and it can change if the environment changes. A heritability of 0.5 does not mean half of one person's trait is genetic.

2 Practice

2.1 State the question the nature-nurture debate actually asks. [2]

2.2 Explain why identical twins raised apart are useful to researchers. [2]

2.3 A researcher reports that height has a heritability of 0.8 in a population.

(a) State what this figure describes. [1]

(b) State one thing it does **not** mean. [1]

3 Exam-style questions

3.1 Fraternal twins share on average what proportion of their genes? [1]

- | | |
|---|---|
| A | B |
| C | D |
- A** all of them
B about three-quarters
C about half
D none

3.2 A trait's heritability estimate rises after a population's schooling becomes uniform. The best explanation is [1]

- | | |
|---|---|
| A | B |
| C | D |
- A** the genes changed
B environmental variation fell, so remaining variation is more genetic
C heritability is fixed and the study is wrong
D the trait became learned

3.3 An evolutionary psychologist studies why humans prefer sweet and fatty foods.

(a) State the kind of explanation this perspective gives. [1]

(b) State one limitation of that kind of explanation. [1]
