AP PSYCHOLOGY • EXERCISE SHEET

1.1 Interaction of Heredity and Environment

Name: _____ Class: _____ Date: _____ **Total: 10 marks**

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** 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** 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]

4 Go further

- work through the **1.1 Interaction of Heredity and Environment** lesson on the **Learn** page;
- read the **Biological Bases of Behavior** section of the AP Psychology handout on the **Know** page.

Solutions

2.1 how much of the variation between people comes from genes and how much from environment; and how the two interact, since both always contribute.

2.2 they share (nearly) all their genes but not their environments; so a similarity between them points to a genetic influence rather than a shared upbringing.

2.3 (a) the proportion of variation in height **within that population** attributable to genetic differences. (b) it does not mean 80% of any one person's height is caused by genes.

3.1 C. fraternal twins are ordinary siblings who share a birth, so about half.

3.2 B. heritability is a ratio; reducing environmental variation raises the genetic share without any genetic change.

3.3 (a) it explains the preference as an adaptation that raised survival or reproduction in ancestral environments. (b) such explanations are hard to test directly, since the ancestral environment cannot be observed.