

2.1 Introducing Statistics: Are Variables Related?

Name: _____ Class: _____ Date: _____ **Total: 9 marks**

KEY WORDS association 关联 • explanatory variable 解释变量 • response variable 响应变量

Objective

Build the skills to answer exam questions on **whether variables are related**.

You must be able to:

- pose a **statistical question** about a relationship between two variables
- distinguish an **explanatory variable** 解释变量 from a **response variable** 响应变量
- recognise that an **association** 关联 describes how two variables vary together

1 Worked examples

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

■ **Explanatory and response**

The **explanatory variable** is the one we think explains or predicts changes; the **response variable** is the outcome we measure.

■ **Association**

An **association** means the two variables **vary together** — as one changes, the other tends to change too. (An association is not the same as causation.)

2 Practice

2.1 State the difference between an explanatory and a response variable. [2]

2.2 Define an association between two variables. [1]

2.3 In “does study time affect test score?”, name the explanatory variable. [1]

3 Exam-style questions

3.1 The variable we think explains or predicts changes is the [1]

- A** response variable
- B** explanatory variable
- C** categorical variable
- D** outlier

3.2 An association means that two variables [1]

- A** are unrelated
- B** vary together
- C** are identical
- D** are both categorical

3.3 A study examines hours of sleep and reaction time.

(a) Name the explanatory variable. [1]

(b) Name the response variable. [1]

(c) State what an association between them would show. [1]

Solutions

2.1 the explanatory variable is thought to explain changes; the response variable is the measured outcome.

2.2 the two variables vary together (as one changes, so does the other).

2.3 study time.

3.1 B.

3.2 B.

3.3 (a) hours of sleep. (b) reaction time. (c) that reaction time varies together with hours of sleep.