

Exercise walk-through

Introducing Statistics: Are Variables Related? ■ 2.1

eXercise

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

Method — Explanatory and response

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

Method — 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.)

Practice 2.1 ■ 2 marks

State the difference between an explanatory and a response variable.

Solution 2.1

Method: Explanatory and response

Worked steps

the explanatory variable is thought to explain changes; the response variable is the measured outcome **B1** **B1**.

Practice 2.2 ■ 1 mark

Define an association between two variables.

Solution 2.2

Method: Association

Worked steps

the two variables vary together (as one changes, so does the other) **B1**.

Practice 2.3 ■ 1 mark

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

Solution 2.3

Method: Explanatory and response

Worked steps

study time **B1**.

Exam-style 3.1 ■ 1 mark

The variable we think explains or predicts changes is the

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

Solution 3.1

Method: Explanatory and response

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



Worked steps

B.

Exam-style 3.2 ■ 1 mark

An association means that two variables

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

Solution 3.2

Method: Association

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



Worked steps

B.

Exam-style 3.3 ■ 1 mark

A study examines hours of sleep and reaction time.

- (a) Name the explanatory variable.
- (b) Name the response variable.
- (c) State what an association between them would show.

Solution 3.3

Method: Explanatory and response

Worked steps

(a) hours of sleep **B1**. (b) reaction time **B1**. (c) that reaction time varies together with hours of sleep **B1**.