Exercise walk-through

3.1 Experimental preparation and data: supported rehearsal

International Baccalaureate · IB Diploma · Psychology · HL

Six research methods

- *Six methods placed by control and by kind of data; the four ringed ones are used in **class practicals***
- **Quantitative data** are numbers; **qualitative data** are words, pictures or descriptions.
- Experiments and questionnaires mostly produce **quantitative data**; interviews mostly **qualitative data**.

The research proposal (internal assessment)

- The **internal assessment** is a research proposal of 24 marks.
- You choose a topic and a **population of interest** (for example, international students in their first year in China), and plan a study with one of the four class-practical methods.
- You argue for every choice, but you do not collect data.
- *The four parts of the research proposal*

Sources for this lesson

- International Baccalaureate, *Psychology guide* (first assessment 2027), Paper 2 and the **internal assessment**.
- Open Science Collaboration, "Estimating the reproducibility of psychological science", *Science* 349 (2015).
- British Psychological Society, *Code of Human Research Ethics* (2021).
- H. Coolican, *Research Methods and Statistics in Psychology* (7th edition, 2019).

Exercises 2.1·2.2

2.1 A researcher tests whether music affects memory. Students learn 20 words, either in silence or with music, and the number of words recalled is counted. Identify the **IV** and the **DV**. [2]



2.2 Write a **research hypothesis** and a **null hypothesis** for a study of whether drinking coffee changes reaction time. [2]



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2.1

IV: whether the students learn in silence or with music; DV: the number of words recalled (out of 20)

2.2 Write a **research hypothesis** and a **null hypothesis** for a study of whether drinking coffee changes reaction time. [2]



2.2

research: people who drink a cup of coffee will have a shorter mean reaction time than people who drink water; null: there will be no difference in mean reaction time, or any difference will be due to chance

Exercises 2.3·2.4

2.3 Explain **one** problem with a repeated measures design and how **counterbalancing** deals with it. [3]

A B half the group

B A other half

2.4 Identify the type of experiment: (a) a study of a new school timetable that the head teacher introduced; (b) a comparison of memory in 15-year-olds and 70-year-olds; (c) a test in a quiet room with a computer task; (d) a test of helping in a real train carriage. [2]

timetable age quiet room train

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order effects: participants may do better in the second condition through practice, or worse through tiredness; counterbalancing: half do condition A then B, half do B then A; so order effects are spread equally over both conditions and do not bias the comparison

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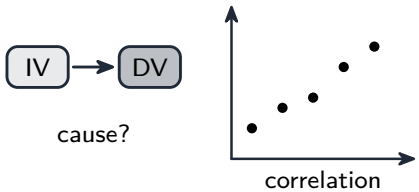
timetable age quiet room train

2.4

(a) natural; (b) quasi; (c) laboratory; (d) field: all four; two or three

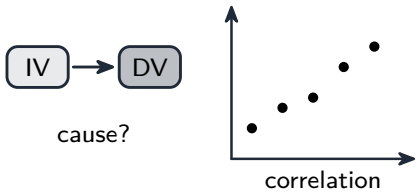
Exercise 2.5

2.5 Explain why an experiment can show cause and effect but a correlational study cannot. [2]



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2.5

in an experiment the researcher changes the IV and controls other variables, so a change in the DV is caused by the IV; a correlation only shows that two variables move together; a third variable or the reverse direction could explain it

Exercise 2.6

2.6 Compare a **questionnaire** and an **observation** as ways to study how often students use their phones in class. [4]





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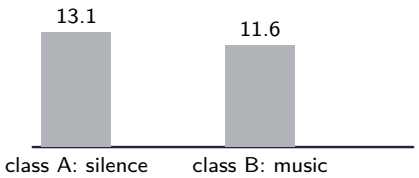
a questionnaire is quick and reaches many students, giving numbers to compare; but students may under-report (social desirability bias); an observation records what students actually do; but it takes longer, covers fewer students, and students may change behaviour when watched

Exercise 3.1

3.1 *(Paper 2 Section B.)* Read the study and answer the question.

A teacher tested whether music harms memory. She used two existing Year 11 classes. Class A (28 students) learned 20 words in silence during the first lesson of the day. Class B (30 students) learned the same words with pop music playing during the last lesson of the day. Students were not told the aim. Class A recalled a mean of 13.1 words (standard deviation 3.0); class B recalled 11.6 words (standard deviation 3.4). The teacher concluded that "music harms students' memory".

Discuss the study with reference to **two or more** of the concepts bias, causality, measurement and responsibility. [15]

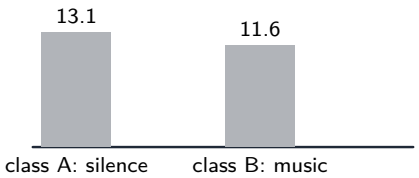


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Full solution on next slide

Full solution 3.1

3.1

Mark with the markbands: [13-15] at least two concepts applied to specific details of the study, effects on the conclusion explained, realistic improvements; [10-12] two concepts applied with some explanation; [7-9] relevant points, partly generic; [4-6] limited, mostly description; [1-3] little that is relevant. Points that may be included: causality: the classes were not randomly allocated, and the time of day differed (first vs last lesson), so tiredness is a confounding variable; the teacher cannot say that music caused the difference; fix: random allocation within each class, same time of day; measurement: the difference (1.5 words) is small compared with the standard deviations (3.0 and 3.4), so it may be due to chance; an inferential test is needed; recall of 20 words is a narrow measure of "memory"; one type of music only; bias: two classes from one school; generalization to all students is not justified; the teacher's expectations could affect how she ran each condition; fix: a second researcher, standard instructions; responsibility: students were not told the aim and may not have given informed consent; debrief them and allow withdrawal; parents' consent for under-16s; conclusion: the claim is too strong for this design