SECOND EDITION

Research Methods Companion

for A Level and AS Psychology

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OXFORD
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In experiment there are often two levels of the independent variable (IV). For example, think back to our experiment on noise and concentration (page 6). The IV was noise, and the two levels were loud and soft noise. The soft noise condition acted as a comparison condition. Both loud and soft noises are experimental conditions. The same experiment could have been conducted with noise and no noise. In this case the no noise condition is called a control condition because it is simply a baseline condition.

Here’s another example: a researcher might want to investigate the effects of two different levels of noise (high and low) on children’s learning. The IV is the level of noise, and the two levels are high and low noise. The children are divided into two groups: an experimental group (exposed to high noise) and a control group (exposed to low noise).

In this example, we can see that having a control condition is crucial because it allows us to compare the effects of the IV (high noise) to a baseline condition (low noise). This helps us understand whether the observed differences in the experimental group are due to the IV or other factors.

**Experimental and Control Groups**

The term control is used in many different ways when talking about experiments:

- The experimenter controls the independent variable.
- The experimenter seeks to control extraneous variables.
- A control group acts as a baseline in some experiments.

In an experiment there are often two levels of the independent variable (IV). For example, think back to our experiment on noise and concentration (page 6). The IV was noise, and the two levels were loud and soft noise. The soft noise condition acted as a comparison condition. Both loud and soft noises are experimental conditions. The same experiment could have been conducted with noise and no noise. In this case the no noise condition is called a control condition because it is simply a baseline condition.

Here’s another example: a researcher might want to investigate the effects that rewards have on performance. To do this, children are taught using the ‘old’ programme (control group) and taught using the ‘new’ programme (experimental group). The difference in performance can be attributed to the reward condition because it is simply a baseline condition.

A playgroup wishes to investigate whether children play differently if an adult is present or not.

- Identifying the independent and dependent variable.
- Write a suitable non-directional hypothesis for this study.
- Describe how you might design a study to investigate this using an independent groups design.
- What kind of experiment is this?
- Explain one strength and one weakness of this kind of experiment in the context of this study.
- In this study identify the experimental group and the control group.
- Identify one or more ethical issues and suggest how you would deal with these.
- To what extent would the findings of your study have representativeness?
- To what extent would the findings of your study have generalisability?
- How could you conduct a study with the same aims using a repeated measures design?
- Identify the experimental and control conditions in this new study.
- Describe one strength and one weakness of using a repeated measures design in this study.

A research study is investigating a new drug for treating depression. There are three conditions in the experiment: (1) the drug, (2) a placebo, (3) nothing. In this case the control condition is having no drug.

**Problems with internal validity**

If we have an experimental group and a control group, it is possible that the experimental group will perform differently for reasons other than the IV (experimental treatment).

Consider a study on the effectiveness of a new teaching programme. One class is taught using the new programme (experimental group) and compared with another class taught using the ‘old’ programme (control group).

- The classes may have a different teacher.
- The experimental group might improve simply because the teaching programme is new (and the students enjoy the novelty), not better.
- The control group might try extra hard to show that the old way is just as good or better than the new approach.

This is called the John Henry effect (see facing page).

**Paying homage to formal terms**

Learning about research methods is a bit like learning a foreign language. You have to learn to use a whole new vocabulary and you have to learn the meaning of this vocabulary. The problem with the vocabulary is that the meaning of the terms is not always black and white. You have to learn to look for the ‘general drift’ and not be fazed when you find that there are slightly different meanings as your understanding increases.

Don’t get too tied up with the words themselves, they are just a vehicle for understanding.

*An excellent phrase ‘invented’ by Hugh Cookson (2004) to explain this problem.*

**mini study**

**Testing the John Henry effect**

John Henry was an American legend. He worked on building the railroad, drilling holes by hitting thick steel plates into holes. There was no one who could reach him, through many trials.

One day someone tried to sell a steam-powered drill to the railroad company, claiming that it could out-drill any man. So they set up a contest between John Henry and the new drill. After 25 minutes of monotonic hammering, John Henry had drilled two nine-foot holes whereas the man with the steam drill had only drilled one nine-foot hole.

**CLASS ACTIVITY**

What is validity all about?

Using what you have learned in this chapter create something to represent the different aspects of validity. It could be a PowerPoint presentation, a mobile, a poster for your classroom, a leaflet, a cartoon strip, a comic, a cartoon, a poem, a rap song – anything that is entertaining and engaging AND forces you to process the material (processing leads to deeper understanding and more enduring memories).
Chapter 2 Different kinds of experiments

MULTIPLE CHOICE QUESTIONS

1. Which of the following is not a characteristic of a field experiment? 
   a. It is conducted in a natural environment. 
   b. The IV is directly manipulated by the experimenter. 
   c. External variables can be well controlled. 
   d. Participants are often not aware that they are being studied.

2. Which of the following is not a characteristic of a lab experiment? 
   a. It is conducted in a natural environment. 
   b. The IV is directly manipulated by the experimenter. 
   c. External variables can be well controlled. 
   d. Participants are often aware that they are being studied.

3. Mundane realism refers to: 
   a. Using video films to capture participants’ behaviour. 
   b. A study being boring and therefore not holding a participant’s interest. 
   c. The extent to which a study mirrors the real world. 
   d. A Spanish football team.

4. Variables in an experiment are operationalised, which means they are: 
   a. Understandable to participants. 
   b. Used in a medical experiment. 
   c. Described in a way that can be easily measured and populated. 
   d. Turned into numbers.

5. Lab experiments are sometimes artificial because: 
   a. Participants know they are being studied and this may affect their behaviour. 
   b. The setting may lack mundane realism. 
   c. The IV may be operationalised in such a way that it doesn’t represent real-life experiences. 
   d. All of the above.

6. Internal validity is concerned with: 
   a. The generalisability of research findings. 
   b. The consistency of measurement. 
   c. Whether an observed effect can be attributed to the IV. 
   d. Whether the findings are what the experimenter expected.

7. External validity refers to: 
   a. The generalisability of research findings. 
   b. Whether the findings are what the experimenter expected. 
   c. Whether an observed effect can be attributed to the IV. 
   d. All of the above.

8. Which of the following is not a kind of external validity? 
   a. Ecological validity. 
   b. Mundane validity. 
   d. Temporal validity.

9. Demand characteristics are: 
   a. Features of an experiment that cannot be controlled. 
   b. Threats to external validity. 
   c. Problem behaviours. 
   d. Guas in a study which help a participant work out the research hypothesis.

10. Which of the following would not be a threat to internal validity? 
    a. Experimenter bias. 
    b. Participant reactivity. 
    c. Social desirability bias. 
    d. Single blind design.

11. The person who designs an experiment is called the: 
    a. Investigator. 
    b. Experimenter. 
    c. Participant. 
    d. Designer.

12. The narrow definition of an investigator effect is any effect the investigator has rate on the test results: 
    a. An investigation. 
    b. Participants’ behaviour. 
    c. External variables. 
    d. All of the above.

13. Ecological validity concerns: 
    a. Representativeness. 
    b. Generalisability. 
    c. Representativeness and reliability. 
    d. Representativeness and generalisability.

14. Which of the following is the best definition for ecological validity? 
    a. Ecological validity is the degree to which behaviour in the laboratory reflects real life. 
    b. Ecological validity is the extent to which findings can be generalised from the lab to the real world.

15. If the participants in a study are only men, then we might think the study had low: 
    b. Ecological validity. 
    c. External validity. 
    d. Both a and c.

16. In a natural experiment: 
    a. The IV is controlled by an experimenter. 
    b. The DV is randomly assigned. 
    c. The DV is controlled by an experimenter. 
    d. The DV varies naturally.

17. Natural experiments are ‘true’ experiments because: 
    a. Participants are not randomly allocated to conditions. 
    b. The sample studied may have unique characteristics. 
    c. The IV is not directly manipulated by the experimenter. 
    d. All of the above.

18. Studies that compare the behaviour of participants in different circumstances (tandem studies) are: 
    a. Difference studies. 
    b. Natural experiments. 
    c. Quasi-experiments. 
    d. Both a and c.

19. Debriefing is: 
    a. An ethical issue. 
    b. An ethical guideline. 
    c. An ethical issue and an ethical guideline. 
    d. A folder for research notes.

20. If informal consent is not possible, then an alternative would be to: 
    a. Give participants the right to withdraw. 
    b. Debrief participants. 
    c. Obtain presumptive consent. 
    d. All of the above.

21. A study (Schultheiss et al., 2004) looked at whether one can explain people’s responses to films in terms of hormones. Hormones are chemical substances produced in the body in response to certain situations. Different hormones have different effects. Female hormones are related to relaxation while male hormones are related to aggression. Men and women have both male and female hormones (change but true). The research question was whether hormones could explain why people feel more lovey-dovey after watching a romantic film and more aggressive after watching an exciting film. 
   In this study there were three groups of participants. 
   One group viewed a romantic scene from The Bridges of Madison County; the second group watched an exciting scene from The Godfather, Part II, and the third group watched a documentary on the Amazon rainforest. 
   The films were shown in a cinema. 
   Each participant had their hormone levels tested before and immediately after viewing the 45-minute film clip. The study found that both male and female experienced raised levels of female hormones when watching the romantic film. In the group watching the exciting scene the men had raised levels of male hormones whereas these hormones were lowered in the women. The third group, watching the Amazon rainforest, showed no significant changes in hormone levels. 
   a. (i) What was the experimental design in this study? (1 mark) 
   b. (ii) Describe one strength of using this design. (2 marks) 
   c. (iii) Identify a suitable sampling method for this study. (1 mark) 
   d. (iv) Explain how you would carry out this. (2 marks) 
   e. (v) Explain why this study could be considered to be a field experiment. (2 marks) 
   f. (vi) Describe one strength and one weakness of doing a field experiment. (2 marks) 
   g. (vii) Explain what is meant by demand characteristics. (2 marks) 
   h. (viii) Imagine that the researcher measured the dependent variable by asking participants to fill in a questionnaire. How would demand characteristics be a problem in such a study? (2 marks) 
   i. (ix) Identify one ethical issue and say how you would deal with it. (3 marks) 
   j. (x) Explain why the third group watched a documentary on the Amazon rainforest. (2 marks) 
   k. (xi) Explain what is meant by external validity. (1 mark) 
   l. (xii) Describe one reason why this study might lack external validity. (2 marks) 
   m. (xiii) Describe one more conclusion that could be drawn from this study. (3 marks) 
   n. (xiv) Identify a suitable graph that could be used to show the findings from this study. (1 mark) 
   o. (xv) What labels would you put on the x and y horizontal and vertical axis of this graph? (2 marks)