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Psychology
Teach Yourself Series
Topic 1: Research Methods (Units 1-4)

Contents

Research Methods

Psychology is the scientific study of our thoughts, feelings and behaviours. As such, it uses the scientific method, or data collected through empirical research to validate its findings. The scientific method is a systematic process that involves formulating a research question, constructing a testable hypothesis, designing the study, gathering the data, analyzing and interpreting the data, and finally, writing a research report. Various experimental designs help this process. This section looks at the requirements of experimental research that you need to be able to cover in Units 1-4 VCE Psychology.

As it appears in Units 1-4

Develop aims and questions, formulate hypotheses and make predictions

Research Aim

The aim of the research should be clearly and concisely defined. It should be a broad statement of the desired outcomes, or the general intentions of the research.

Formulation of research hypotheses

A hypothesis is a statement or testable prediction of what will happen between two variables. A good hypothesis clearly defines both variables and links them in a cohesive statement. For example, if a researcher was interested in seeing whether the amount of sleep an individual received every night affected their performance in a spatial awareness test, then they would need to predict what they think would happen. In the example given above, the independent variable (IV) (the variable manipulated by the researcher) would be the amount of sleep the participants received. The dependent variable (DV) (which is measured by the experimenter) would be their score on the spatial awareness test. The researcher may predict, based on past research that participants who had less sleep would perform more poorly on the spatial awareness test. Their hypothesis may read something like this: "It is hypothesised that participants who receive less than eight hours sleep per night will score lower on a spatial awareness test than participants who receive eight hours sleep per night". When the population is known, this will always be stated in the hypothesis.

Identification of independent, dependent and extraneous variables

A variable is any factor that can change as a result of circumstance. Variables can be changed or manipulated by the experimenter (independent variable), or they can change as a result of this manipulation (dependent variable). Sometimes, they aren't controlled by the experimenter and therefore may affect the results (extraneous variable).

Consider the following example: A researcher is interested in seeing whether eating chocolate improves memory. She finds 20 participants. 10 of them eat one chocolate bar every day for a week. The other 10 eat no chocolate. At the end of the week, the participants are presented with a list of 30 unrelated words and are asked to memorize as many as they can in 3 minutes.

Independent variable (IV) - This is the variable that is changed or manipulated by the experimenter in an experiment. They manipulate this variable to see whether or not doing so has an effect on the outcome. In the above example, the independent variable is whether the participants ate chocolate for the week or not.

Dependent variable (DV) - This is the outcome, or result of the manipulation of the IV. It is the results of the experiment. In the above example, the dependent variable is the number of words that participants were able to recall from the list of 30 words.

Extraneous variables (EV) - These are additional, unwanted variables that may affect the outcome of the experiment. A good research design will try to control or eliminate the possibility of extraneous variables. In the above example, an extraneous variable could be the age of the participants (memory can be affected by age), how much chocolate they generally eat each week, their general intelligence level, the time of day the experiment was conducted and so on.

Review Questions

1. A researcher is interested in determining whether people find jokes funnier if they are told in a group or to an individual. She recruits people to tell a joke to an individual participant and then the same joke to a group of five participants. She then asks the participants to rate the joke on a scale of 1-5.

    a. Write a suitable hypothesis for this experiment.

    _____

    _____

    b. Identify the independent variable.

    _____

    _____

    c. Identify the dependent variable.

    _____

    _____

d. Identify a potential extraneous variable.

_____

_____

Plan and undertake investigations

Use of control and experimental groups

In any experiment, there is a control group or condition and an experimental group or condition. The control group receives no treatment or is not exposed to the independent variable. The experimental group receives treatment or is exposed to the independent variable.

Types of investigations

Type of Study	Description	Advantages	Limitations
Case studies	An in-depth study of an individual or small group.	• It is detailed • Enables research of areas that cannot be ethically manipulated. • Can lead to a hypothesis that can be tested experimentally.	• Very time consuming • Can't be generalised
Observational Studies	Data is gathered through observing the behavior of participants (in a lab or in a naturalistic setting).	• Behavior is spontaneous and natural • Large amounts of data can be collected	• Demand characteristics can be a problem • Observer bias may occur • Descriptive data is time consuming
Surveys	Information is gathered from participants using self-report methods such as questionnaires.	• Large amounts of data can be collected quickly • Can be collated quickly	• May not be truthful in responses • Can be time consuming (e.g. phone surveys)
Questionnaires	Set of questions administered to participants	• As above	• As above
Interviews	Participant has a conversation with the researcher. Can be individual or in groups.	• Can get detailed information	• May not get truthful responses
Rating Scales	Also called Likert scales. Participants state their agreement with statements on a scale of 1-5.	• Quick to collate • Large amounts of data obtained quickly	• Can't explain responses • Demand effects

Solutions to Review Questions

1.

    a. It is hypothesised that participants will rate a joke as more funny (on a scale of 1-5) if the joke is told in a group as opposed to if the joke is told to an individual participant.

    b. If it is told in a group or individually.

    c. How funny they rate it (score out of 5).

    d. Any acceptable extraneous variable. E.g. The joke that is told; whether people have heard it before; the way it is delivered; the group members, etc.

2. Repeated measures has higher levels of control of participant variables than independent groups design.

3. Matched participants has higher levels of control of participant variables than independent groups design.

4. Cross sectional studies investigate two or more different sections of the population at the same time and compare their results. For example, looking at the memory abilities of 20 year olds and 60 year olds.

5. A confounding variable has not been controlled and it is impossible to tell if the results are due to the IV or because of the confounding variable. An EV is a variable that, if not controlled, has the potential to become confounded.

6. True random sampling is very hard to achieve.

7. It is faster because it's not necessary to put the participants into strata before selecting them.

8. In a single-blind procedure only the participants are unaware if they are in the control or experimental group. In a double-blind experiment both the experimenter and the participants are oblivious to who is in the control and who is in the experimental condition.

9. By delivering the instructions in the same way and the tasks in the same way it ensures that the way in which participants were instructed does not become an EV.

10. The value of 0.023 means that there is a 2.3% likelihood that the results are due to chance and not because of the IV. They are significant which means they can be generalized to the wider population.

11. Order effects occur in repeated measures designs. Because participants are in both the control and experimental conditions they may learn and perform better in the second task, or they may become bored or fatigued and perform worse.