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Research methods

How do you carry out psychological research?

LESSON ONE : EXPERIMENTAL METHODS  **Introduction**Experimental methods all have one thing in common: they are attempting to find a **cause and effect relationship** between an independent variable (IV) and dependent variable (DV), and to measure the extent of this effect. There are four different types of experiment:   
**1. Laboratory experiment 2. Field experiment 3. Natural experiment  
4. Quasi experiment.**

**Laboratory Experiments   
Laboratory experiments** are conducted under specified **controlled conditions** in which the researcher manipulates the independent variable (IV) to measure the effect on the dependent variable (DV). The conditions are heavily controlled in order to minimise the effect of any extraneous variables, to prevent them from becoming a confounding variable which might adversely affect the DV. Participants will be aware that they are taking part in an investigation due to the contrived nature of the situation which may feel unlike real‐life.  **Field Experiments   
Field experiments** are carried out in **natural conditions**, in which the researcher manipulates the independent variable (IV) to measure the effect on the dependent variable (DV). The ‘field’ is considered any location which is not a laboratory. Participants in a field experiment typically do not know that they are taking part in an investigation with a view to observing more natural behaviour.

**Natural Experiments**In a **natural experiment**, the researcher does not manipulate the IV and instead examines the effect of an existing IV on the dependent variable (DV). This IV is *naturally* occurring, such as a flood or earthquake,and the behaviour of people affected is either compared to their own behaviour beforehand, when possible, or with a control group who have not encountered the IV. It is important to note that it is the IV which is natural in this type of experiment, and not necessarily the context in which the investigation is taking place since participants could be tested in a laboratory as part of the study.   
**Quasi Experiments   
Quasi experiments** also contain a naturally occurring independent variable (IV), but one which already exists. However, in this instance the IV is a difference *between people* such as gender, age or a personality trait. The researcher examines the effect of this IV on the dependent variable (DV). Quasi experiments do not have to be conducted in a natural setting, although they often are. They may also be conducted in a laboratory setting, under controlled conditions.

**Questions**

1. What is meant by the term ‘quasi experiment’?

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2. Identify **two** features of an experiment.

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3. Outline what is meant by a *laboratory experiment*. ………………………………………………………………………………………   
4. Identify and explain **one** difference between a laboratory and a field experiment.

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5. Describe **one** difference between a natural experiment and a field experiment.

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6. What is meant by an *extraneous variable*?

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7. Explain why it is important to control extraneous variables in experimental research.

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LESSON TWO :OBSERVATIONAL TECHNIQUES

**Introduction to Observational Techniques**When conducting an observation, the researcher has the choice between:  
♦**Covert** and **overt**♦**Participant** and **non‐participant**♦ **Naturalistic** and **controlled**♦**Structured** and **unstructured**It is important to note that these techniques are not mutually exclusive: it is quite possible for an observation to be naturalistic, unstructured, participant and overt all at the same time, as these terms refer to different aspects of the methods.  
**Covert Observations**A **covert observation** is also known as **‘undisclosed’** observation and consists of observing people without their knowledge; for example, using a one‐way mirror (covert non‐participant) or joining a group as a member (covert participant). Participants may be informed of their involvement in the study after the observation has taken place.   
**Overt Observations**An **overt observation** is an observational technique where the observations are ‘open’ and the participants know/are aware that they are being observed. For example, filming publicly (overt non‐participant) or joining a class and informing the other students that you are carrying out an observation .

**Participant Observations**In a **participant observation,** the person who is conducting the observation also takes part in the activity being observed. It can be either covert (a group member quietly observing others without their knowledge) or overt (a group member using a camera to record the behaviour of other members with their full knowledge).  
**Non‐Participant Observations**In a **non‐participant observation**, the person who is conducting the observation does not participate in the activity being observed. This type of observation is quite common in educational settings, as in teacher evaluations, for example, when an observer sits in the corner of the room and watches the lesson. The aim  
is for the observer to be as unobtrusive as possible and not engage with any of the activities happening.

**Naturalistic Observations**A **naturalistic observation** is an observation carried out in an unaltered setting in which the observer does not interfere in any way and merely observes the behaviour in question as it happens normally. An example of this would be an observation carried out in a shopping centre as people go about their daily business.

**Controlled Observations**A **controlled observation** is conducted under strict conditions, such as in an observation room or laboratory setting where extraneous variables (such as time of day, noise, temperature and visual distractions) can be controlled to avoid interference with the behaviour being observed. Sometimes one‐way mirrors can be used for these types of observations. If the participants know they are being observed, this is an overt method which is most commonly the case for controlled observations.

**Structured Observations**In **structured observations**, the researcher uses coded ‘schedules’ according to a previously agreed formula to document the behaviour and organise data into **behavioural categories**. A behavioural category is when psychologists must decide which specific behaviours should be examined. This involves breaking the target behaviour (e.g. aggression) into components that can be observed and measured (e.g. hitting or kicking).

**Unstructured Observations**An **unstructured observation** involves every instance of the observed behaviour being recorded and described in as much detail as possible. This is useful if the behaviour that researchers are interested in does not occur very often and is more usual with naturalistic observation.

**Questions**

1. Explain how observational research can be enhanced through the use of operationalised behavioural categories.

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1. Explain what is meant by ‘overt observation’.

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1. Describe what is meant by ‘participant observation’.

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1. Explain what is meant by ‘event sampling’ in relation to observational research in psychology.

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1. Explain the difference between a participant observation and a non‐participant observation.

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LESSON THREE :Hypotheses

Every research study has a null hypothesis and an alternative (experimental) hypothesis. Hypotheses are different from the aims of a study, which show the  
area of interest or investigation. Instead, hypotheses are statements of predicted outcomes based on the theory being tested.   
The way in which a hypothesis is written depends on whether the investigation is looking for a difference in conditions (as a result of the IV) or a relationship  
between variables (in a correlation).

**Null hypothesis** : A null hypothesis is a prediction that the result or outcome will find no effect or very little effect.

To write a null hypothesis, you need to imagine what would happen if you found very little effect of your IV on your DV.   
For example, a null hypothesis when you are looking for a difference could be:  
There will be no difference in the number of digits recalled whether participants were happy or sad. Any difference will be due to chance.

We add ‘any difference found will be due to chance’because it is unlikely that no difference will be found,but the difference found will be too small to be due to  
the emotional state.   
A null hypothesis when looking for a relationship (correlation) could be:  
There will be no relationship between time spent revising and percentage score on a test; any relationship found will be due to chance.

**Alternative (experimental) hypotheses**: An alternative hypothesis is a prediction of the expected outcome of a study. This is usually based on a theory.  
If a theory makes a clear claim, then we can use a **directional hypothesis** (because the expected direction that the results will go can be predicted). For example,when looking for a difference:   
Adults will recall more digits than children.   
When looking for a relationship (correlation):   
There will be a negative correlation between self-esteem and depression OR the more depressed people feel, the lower their self-esteem.   
If a theory cannot make a clear prediction, or if the evidence is mixed, then we use a non-directional hypothesis. A **non-directional hypothesis** states that a difference or relationship will be found, but does not state what that difference or relationship will be. For example, when looking for a difference:   
There will be a difference in the number of digits recalled by adults and children.  
When looking for a relationship (correlation):   
**There will be a negative correlation between selfesteem and depression.**   
An experimental hypothesis is used when a laboratory or field experiment is being carried out.

**Key terms :**

**Null hypothesis:** a prediction that the results will fail to show any difference (or relationship) that is consistent or systematic.

**Alternative (experimental) hypothesis:** a prediction of the outcome of a study based on what is expected to happen.

**Directional hypothesis:** a hypothesis that predicts the direction the results will go in.  
**Non-directional hypothesis:** a hypothesis that predicts that a difference/relationship will be found, but does not specify what the difference/relationship will be.

**Experimental hypothesis:** the name given to a hypothesis when used in field and laboratory experiments.  
**Questions :**

1. Read the statements below and identify which are aims and which are hypotheses.  
   **a.** Younger people have better memories than older people. [……….…….]  
   **b.** Positive expectations lead to differences in performance. [……………..]  
   **c.** Lack of sleep may affect schoolwork. [……………..]  
     
   **2.** For each of the following, decide whether it is a directional or nondirectional hypothesis or a null hypothesis.  
   **a.** Boys score differently on aggressiveness tests than girls. [……………..]  
     
   **b.** There is no difference in the exam performance of students who have a computer at home compared with those who don’t. [……………..]  
   **c.** People remember the words that are early in a list better than the words that appear later. [……………..]  
   **d.** Words presented in a written form are recalled differently from those presented in a pictorial form. [……………..]

**3.** Now write your own. Below are research aims for possible experiments. For each one write **three** hypotheses: a directional one, a nondirectional one and a null hypothesis.  
**a.** Do girls score better than boys in Math?

Directional…………………………………………………………………………..

N/ directional……………………………………………………………………..

Null………………………………………………………………………..  
**b.** Do teachers give more active students higher marks on essays than students who are less active?

Directional…………………………………………………………………………..

N/ directional……………………………………………………………………..

Null………………………………………………………………………..  
  
**c.** A researcher believes older people sleep more than younger people.

Directional…………………………………………………………………………..

N/ directional……………………………………………………………………..

Null………………………………………………………………………..  
  
**d.** Do people rate food as looking more attractive when they are hungry?

Directional…………………………………………………………………………..

N/ directional……………………………………………………………………..

Null………………………………………………………………………..  
  
**e.** A teacher wishes to find out whether one maths test is harder than another maths test.

Directional…………………………………………………………………………..

N/ directional……………………………………………………………………..

Null………………………………………………………………………..