

Research methodology

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Research

- A systematic process of collecting and analyzing information in order to increase our understanding of the phenomena with which we are interested.
- Research is simply the process of **finding solutions to a problem** after through **study and analysis of the situational factors**. It is gathering information needed to answer a question, and thereby help in solving a problem.
- The research setting may be a laboratory or the real world

Assessment techniques also varies

- Some researcher observe and record behavior
- In other studies, people self-report on their thoughts and behavior

- Psychologists use the scientific method to conduct their research.
- The scientific method is a standardized way of making observations, gathering data, forming theories, testing predictions, and interpreting results. Researchers make observations in order to describe and measure behavior.

Research process

Step 1: Find a Research Idea: Select a Topic and Search the Literature to Find an Unanswered Question

- The first step in the research process is to find a research idea.
- identify a general topic that you would like to explore and review the background literature to find a specific research idea or question.
 1. Selecting a general topic area (such as human development, perception, social interaction, and so on).
 2. Reviewing the literature in that area to identify the relevant variables and find an unanswered question.

2. Form a Hypothesis and a Prediction Form a hypothesis, or tentative answer to your research question, and use the hypothesis to generate a specific research prediction.

3. Define & Measure Variables

Identify the specific procedures that will be used to define and measure all variables. Plan to evaluate the validity and reliability of your measurement procedure.

4. Identify and Select Participants or Subjects

Decide how many participants or subjects you will need, what characteristics they should have, and how they will be selected. Also plan for their ethical treatment.

5. Select a Research Strategy

Consider internal and external validity and decide between an experimental (cause-effect), or a non-experimental, descriptive, correlational, or quasi-experimental strategy.

6. Research design

Research design is a master plan specifying the methods and procedures for collecting and analyzing the needed information. It is a framework or the blueprint that plans the action for research project.

7. Conduct the Study

Collect the data.

8. Evaluate the Data

Once the data have been collected, you must use various statistical methods to examine and evaluate the data. This involves drawing graphs, computing means or correlations to describe your data,

9. Report the Results

Use the established guidelines for format and style to prepare an accurate and honest report that also protects the anonymity and confidentiality of the participants.

- **10. Refine or Reformulate Your Research Idea**

Use the result to modify, refine, or expand your original research idea, or to generate new ideas.

- Most research studies generate more questions than they answer. If your results support your original hypothesis, it does not mean that you have found a final answer.

Scientific

- Controlled
- unbiased
- Valid and reliable
- Testable
- Accurate
- Clear definition

Non scientific

- Uncontrolled
- Biased
- Not valid or reliable
- Un-testable
- Inaccurate
- Ambiguous

Important Characteristics of Scientific Method

Empirical

- Scientific method is concerned with the realities that are **observable through “sensory experiences.**
- It generates knowledge which is verifiable by experience or observation.
- Some of the realities could be directly observed, like the number of students present in the class and how many of them are male and how many female.

- The same students have attitudes, values, motivations, aspirations, and commitments. These are also realities which cannot be observed directly, but the **researchers have designed ways to observe these indirectly**
- Any reality that cannot be put to “sensory experience” directly or indirectly does not fall within the domain of scientific method.

Verifiable

- Observations made through scientific method are to be **verified again by using the senses to confirm or refute the previous findings.** Such confirmations may have to be made by the same researcher or others.
- Whatever we conclude on the basis of our findings is correct and can be verified by us and other.

Cumulative

- Prior to the start of any study, the researchers try to **scan through the literature** and see that their study is not a **repetition in ignorance**. Instead of reinventing the wheel, the researchers take stock of the existing body of knowledge and try to build on it.
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- **A linkage between the present and the previous body of knowledge** has to be established, and that is how the knowledge accumulates.
- the existing body of knowledge provides a huge foundation on which the researchers build on and hence the knowledge keeps on growing.

Deterministic

- Science is based on the assumption that **all events have antecedent causes** that are subject to identification and logical understanding. For the scientist, nothing “just happens” – it happens for a reason.
- (students fail)

Ethical and ideological neutrality

- The conclusions drawn through interpretation of the results of data analysis should be objective; that is, they **should be based on the facts of the findings derived from actual data**, and not on our own subjective or emotional values.

Statistical Generalization

- Generalizability refers to the **scope of the research findings in one organizational setting to other settings**. Obviously, the wider the range of applicability of the solutions generated by research, the more useful the research is to users.
- if a researcher's findings that person job fit employee enhance job performance are found to be true in a variety of manufacturing, industrial, and service organizations. the generalizability of the findings to other organizational settings is enhanced. The more generalizable the research, the greater is its usefulness and value.

Rationalism

- Science is fundamentally a rational activity, and the scientific explanation must make sense. Religion may rest on revelations, custom, or traditions, gambling on faith, but science must rest on **logical reason**.

Theory

- A theory is a system of interrelated ideas used to explain a set of observation
- Set of principle on which the practice of any activity is base

A psychological theory has two key components

- It must describe a behavior
- It must make predictions about future behaviors.

Hypothesis

- A hypothesis tells what relationship a researcher expects to find between an independent variable and dependent variable
- A hypothesis is a tentative set of beliefs about the nature of the world

Variable

- Variable may be defined as those attributes, qualities, and characteristics of objects, events, and things, which can be measured.
- A **variable** is anything that can vary, i.e. changed or be changed, such as memory,
- Variable in a scientific investigation in any condition that may change in quantity and quality.
Intelligence, anxiety, aptitude, income, education.

An example that helps you to understand the concept of independent variable and dependent variable.

If you want to know whether caffeine affects your appetite, the presence/absence of a given amount of caffeine would be the independent variable. How hungry you are would be the dependent variable.

if we are concerned with the effect of media violence on aggression,

Aggression is dependent variable

Media violence is independent variable

Independent variables

- It is a condition or event that an experimenter varies in order to see its impact on another variable.
- a variable that is manipulated by the researcher to see how it affects the depended variable. It is the variable that the experimenter deliberately (wishfully) manipulates.

Dependent variable

- It is the variable that is thought to be affected by manipulation of the independent variable.
- The variable that is measured and is expected to change as a result of changes caused by the experimenter's manipulation of the independent variable.

- **Continuous variable. (infinite numbers).** is one which can take on an uncountable set of values
E.g . Age, time, weight
- **Discrete variable. (finite numbers)** is a variable whose value is obtained by counting
- E.g number of cars, number of children, students etc.
- **Extraneous variable**
Extraneous variable are any variables other than the independent variable that seem likely to influence the independent variable in a specific study.
e.g if you want the relationship between student working hours (IV) and exam performance (DV) student intelligence play as one of the extraneous variable in the study.

Experimental and control group

- **Experimental condition** the experimental group consists of the subjects who receive some special treatment in regard to the independent variable
- **Control condition.** The control group consists of similar subjects who do not receive the special treatment given to the experimental group

- Control is any method for dealing with extraneous variable that may affect your study. The experimenter seeks to eliminate the effects of irrelevant variables by controlling, them, leaving only the experimental variable.
- In experimental method. Examine the effect of independent variable on dependent variable under control condition.

Advantages

- Experimental method is the only method that allows the experimenter to infer **cause and effect** relationship
- In experimental method, the experimenter can exercise **control** over other **confounding variables**.
- It helps in conducting a systematic, objective, précised, planned, **well organized**, and a well-controlled scientific study.

Disadvantages

- Its control is its weakness. **Artificial** situation in which all the variables are carefully controlled is not a normal natural situation. As a result, the researcher or the experimenter may have difficulty generalizing the finding from observations in an experiment to the real world.
- All the psychological phenomena can't be studied by this method.
- The experimental method is **costly** in terms of money and time. A well established laboratory and trained personnel are needed to conduct experiment.

Correlation

- A study to determine the relationship between two variable
- A correlation is a statistical measure of relationship: it reveals how closely two things vary together and thus how well one predicts the other.
- A **positive correlation** indicates a direct relationship, meaning that two things increase together or decrease together.
- A **negative correlation** indicates an Inverse relationship: as one thing increases, the other decreases.

Advantage. Can asses the strength of relation

Disadvantage. Cause and effect don't know

Case study

It is an in detail information or in-depth analysis of a person /group/ organization

Advantage

- A large amount of information
- Better understanding

Disadvantage

- Time consuming
- Limit generalization
- Only one case involve

Surveys

- Research in which people chosen to represent a larger population are asked a series of questions about their behavior, thoughts, or attitudes.
- In a survey researchers use questionnaires or interviews to gather information about specific aspects of participants background , attitudes, beliefs, or behavior.
- Surveys are often used to obtain information on aspects of behavior that are difficult to observe directly.
- Surveys also make it relatively easy to collect data on attitudes and opinions from large samples of participants.
- The major problem with surveys is that they depend on self-report data.

Observation

- **the researcher observes and systematically** records the behavior of individuals to describe the behavior.

Observational methods can be classified as direct observation or indirect observation

- Researcher often observe behavior while it occur is called **direct observation**
- When researchers examine evidence of past behavior using physical traces or archival record is called **indirect observation**

Direct observation

- Direct observational method can be classified as “observation without intervention”, or “observation with intervention
- intervention refers to researchers efforts to change or create the context for observation.

Observation without intervention

- The goals of *naturalistic* observation are to describe behavior as it normally occurs and to examine relationships among variables

Observation with intervention.

1. Participant observation
2. Structure observation
3. Field experiment

Indirect observation

- Behavior observed **indirectly through records and other evidence of people's behavior**. These methods are called unobtrusive measures.
- Because the researcher **does not intervene** in the situation and individuals are **not aware** of the observation.
- An important advantage of indirect observational methods is that **they are nonreactive**