

# CHAPTER 4

## Formulating a Research Problem

If you have a specific idea for the basis of your enquiry, you do not need to go through this chapter. However, you should make sure that your idea is researchable as not all problems lend themselves to research methodologies.

Most research in the humanities revolves around four Ps:

people;  
problems;  
programmes;  
phenomena.

Every research study has two aspects: the *people* provide you with the ‘study population’, whereas the other three Ps furnish the ‘subject areas’.

# CHAPTER 5

## Identifying Variables

### **The difference between a concept and a variable**

A concept cannot be measured whereas a variable can be subjected to measurement.

It is therefore important for the concepts to be converted into variables.

### **Converting concepts into variables**

Some concepts, such as ‘rich’ (in terms of wealth), can easily be converted into indicators and then variables. For example, to decide objectively if a person is ‘rich’, one first needs to decide upon the indicators of wealth. Assume that we decide upon income and assets as the indicators. Income is also a variable since it can be measured in dollars; therefore, you do not need to convert this into a variable.

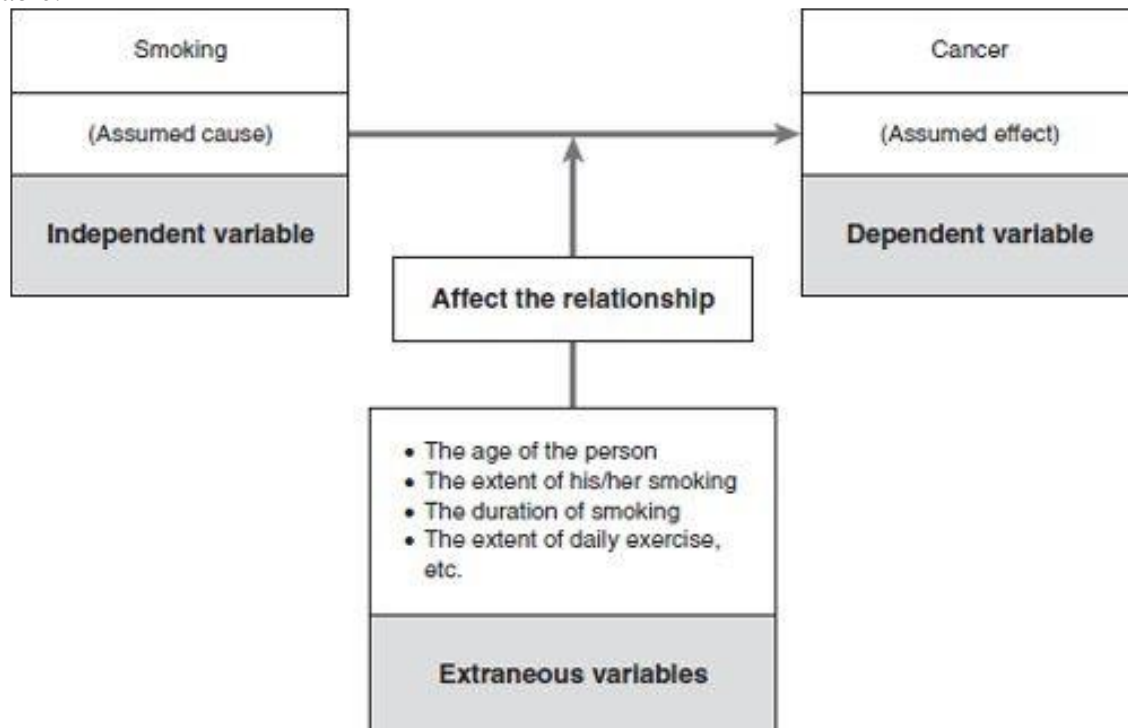
### **Types of variable**

#### **From the viewpoint of causal relationship**

1. **Independent variable** – the cause supposed to be responsible for bringing about change(s) in a phenomenon or situation.
2. **Dependent variable** – the outcome or change(s) brought about by introduction of an independent variable.

3. **Extraneous variable** –may increase or decrease the magnitude or strength of the relationship between independent and dependent variables.
4. **Intervening variable** –In certain situations the relationship between an independent and a dependent variable cannot be established without the intervention of another Variable.

smoking is the independent variable, cancer is the dependent variable.



### From the viewpoint of the study design

**Active variables** – those variables that can be manipulated, changed or controlled.

**Attribute variables** – those variables that cannot be manipulated, changed or controlled, and that reflect the characteristics of the study population, for example age, gender, education and income.

a researcher does not have any control over characteristics of the student population such as their age, gender or motivation to study.

### From the viewpoint of the unit of measurement

- whether the unit of measurement is categorical (as in nominal and ordinal scales) or continuous in nature (as in interval and ratio scales);
- whether it is qualitative (as in nominal and ordinal scales) or quantitative in nature (as in interval and ratio scales).

### Types of measurement scale

Qualitative research

mostly uses descriptive statements to seek answers to the research questions, whereas in quantitative research these answers are usually sought on one of the measurement scales (nominal, ordinal, interval or ratio).

- nominal or classificatory scale;
- ordinal or ranking scale;
- interval scale;
- ratio scale.

### **The nominal or classificatory scale**

the variable 'gender' can be classified into two subcategories: male and female. Political parties in Australia can similarly be classified into four main subcategories: Labor, Liberal, Democrats and Greens.

### **The ordinal or ranking scale**

ranks the subgroups in a certain order.

### **The interval scale**

Celsius and Fahrenheit scales are examples of an interval scale. In the Celsius system the starting point (considered as the freezing point) is 0°C and the terminating point (considered as the boiling point) is 100°C. The gap between the freezing and boiling points is divided into 100 equally spaced intervals, known as degrees. In the Fahrenheit system the freezing point is 32°F and the boiling point is 212°F, and the gap between the two points is divided into 180 equally spaced intervals. Each degree or interval is a measurement of temperature – the higher the degree, the higher the temperature. As the starting and terminating points are arbitrary, they are not absolute; that is, you cannot say that 60°C is twice as hot as 30°C or 30°F is three times hotter than 10°F.

### **The ratio scale**

it is an absolute scale. measurement of income, age, height and weight are examples of this scale. A person who is 40 years of age is twice as old as a 20-year-old.

# CHAPTER 6

## Constructing Hypotheses

quantitative research: Suppose you have a hunch that there are more smokers than non-smokers in your class. To test your hunch, you ask either all or just some of the class if they are smokers. You can then conclude whether your hunch was right or wrong.

Hence, a hypothesis is a hunch, assumption, suspicion, assertion or an idea about a phenomenon, relationship or situation, the reality or truth of which you do not know.

### The functions of a hypothesis

having a hypothesis is not essential

- provides a study with focus.
- what data to collect.
- enhances objectivity.
- It enables you to conclude.

### Types of hypothesis

Theoretically there should be only one type of hypothesis, that is the research hypothesis – the basis of your investigation

Broadly, there are two categories of hypothesis:

1. research hypotheses;
2. alternate hypotheses.

The formulation of an **alternate hypothesis** is a convention in scientific circles. Its main function is to explicitly specify the relationship that will be considered as true in case the research hypothesis proves to be wrong. In a way, an alternate hypothesis is the opposite of the research hypothesis.

Conventionally, a null hypothesis, or hypothesis of no difference, is formulated as an alternate hypothesis.

1. There is no significant difference in the proportion of male and female smokers in the study population.(null hypothesis)
2. A greater proportion of females than males are smokers in the study population.
3. A total of 60 per cent of females and 30 per cent of males in the study population are smokers.
4. There are twice as many female smokers as male smokers in the study population.(Research hypothesis)

When you construct a hypothesis stipulating that there is no difference between two situations, groups, outcomes, or the prevalence of a condition or phenomenon, this is called a **null hypothesis** and is usually written as  $H_0$ .

### Errors in testing a hypothesis

*When all null hypothesis is actually:*

		False	True
When your decision is to:	Reject	Correct decision	Type I error
	Accept	Type II error	Correct decision

-----Important-----

Hence, in drawing conclusions about a hypothesis, two types of error can occur:

- *Rejection* of a null hypothesis when it is true. This is known as a **Type I error**.
- *Acceptance* of a null hypothesis when it is false. This is known as a **Type II error**.

### Hypotheses in qualitative research

As qualitative studies are characterised by an emphasis on describing, understanding and exploring phenomena using categorical and subjective measurement procedures, construction of hypotheses is neither advocated nor practised.

## CHAPTER 7

### The Research Design

If you are clear about your research problem, your achievement is worth praising. You have crossed one of the most important and difficult sections of your research journey. Having decided *what* you want to study, you now need to determine *how* you are going to conduct your study. There are a number of questions that need to be answered before you can proceed with your journey. What procedures will you adopt to obtain answers to research questions? How will you carry out the tasks needed to complete the different components of the research process? What should you do and what should you not do in the process of undertaking the study? Basically, answers to these questions constitute the core of a research design.

# CHAPTER 8

## Selecting a Study Design

clear. Quantitative study designs have more clarity and distinction between designs and methods of data collection. In qualitative research there is an overlap between the two. in-depth interviewing is a design as well as a method of data collection and so are oral history and participant observation.

Because of flexibility and lack of control it is more difficult to check researcher bias in qualitative studies.

If your interest is in studying values, beliefs, understandings, perceptions, meanings, etc., qualitative study designs are more appropriate as they provide immense flexibility. On the other hand, if your focus is to measure the magnitude of that variation, ‘how many people have a particular value, belief, etc.’, the quantitative designs are more appropriate.

### **Study designs based on the number of contacts**

1. cross-sectional studies;
2. before-and-after studies;
3. longitudinal studies.

**Cross-sectional studies**, also known as one-shot or status studies.

They are useful in obtaining an overall ‘picture’ as it stands at the time of the study.

As these studies involve only one contact with the study population, they are comparatively cheap to undertake and easy to analyse. However, their biggest disadvantage is that they cannot measure change.

### ***The before-and-after study design***

The main advantage of the before-and-after design (also known as the pre-test/post-test design) is that it can measure change in a situation, phenomenon, issue, problem or attitude.

A before-and-after design can be described as two sets of cross-sectional data collection points on the same population to find out the change in the phenomenon or variable(s) between two points in time.

### **The longitudinal study design**

The before-and-after study design is appropriate for measuring the extent of change in a phenomenon,

situation, problem, attitude, and so on, but is less helpful for studying the pattern of change. To determine the pattern of change in relation to time, a longitudinal design is used; for example, when you wish to study the proportion of people adopting a program me over a period.

Longitudinal studies are also useful when you need to collect factual information on a continuing

basis. You may want to ascertain the trends in the demand for labour, immigration, changes in the incidence of a disease or in the mortality, morbidity and fertility patterns of a population.

In longitudinal studies the study population is visited a number of times at regular intervals, usually over a long period, to collect the required information (see Figure 8.4). These intervals are not fixed so their length may vary from study to study. Intervals might be as short as a week or longer than a year.

### **Study designs based on the reference period**

- retrospective;
- prospective;
- retrospective–prospective.

#### ***The retrospective study design***

Retrospective studies investigate a phenomenon, situation, problem or issue that has happened in the past.

#### ***The prospective study design***

Prospective studies refer to the likely prevalence of a phenomenon, situation, problem, attitude or outcome in the future.

#### ***The retrospective–prospective study design***

**Retrospective–prospective studies** focus on past trends in a phenomenon and study it into the future.

Part of the data is collected retrospectively from the existing records before the intervention is introduced and then the study population is followed to ascertain the impact of the intervention.

### ***Experimental study designs***

#### ***The after-only experimental design***

In an after-only design the researcher knows that a population is being, or has been, exposed to an intervention and wishes to study its impact on the population.

#### ***The control group design***

In a study utilising the control group design the researcher selects two population groups instead of one: a **control group** and an **experimental group**.

#### ***The ‘placebo’ design***

A patient’s belief that s/he is receiving treatment can play an important role in his/her recovery from an illness even if treatment is ineffective. This psychological effect is known as the **placebo effect**. A placebo design attempts to determine the extent of this effect. A **placebo study** involves two or three groups, depending on whether or not the researcher wants to have a control group (Figure 8.13). If the researcher decides to have a control group, the first group receives the treatment, the second receives the placebo treatment and the third – the control group – receives

nothing. The decision as to which group will be the treatment, the placebo or the control group can also be made through randomisation.

### **The cross-over comparative experimental design**

The denial of treatment to the control group is considered unethical by some professionals. In addition, the denial of treatment may be unacceptable to some individuals in the control group, which could result in them dropping out of the experiment and/or going elsewhere to receive treatment. The former increases 'experimental mortality' and the latter may contaminate the study. The **cross-over comparative experimental design** makes it possible to measure the impact of a treatment without denying treatment to any group, though this design has its own problems.

In the cross-over design, also called the ABAB design (Grinnell 1993: 104), two groups are formed, the intervention is introduced to one of them and, after a certain period, the impact of this intervention is measured. Then the interventions are 'crossed over'; that is, the experimental group becomes the control and vice versa, sometimes repeatedly over the period of the study.

### **Trend studies**

If you want to map change over a period, a **trend study** is the most appropriate method of investigation.

Trend analysis enables you to find out what has happened in the past, what is happening now and what is likely to happen in the future in a population group.

**Cohort studies** are based upon the existence of a common characteristic such as year of birth, graduation or marriage, within a subgroup of a population. Suppose you want to study the employment pattern of a batch of accountants who graduated from a university in 1975, or study the fertility behaviour of women who were married in 1930.

### **Panel studies**

**Panel studies** are similar to trend and cohort studies except that in addition to being longitudinal they are also prospective in nature and the information is always collected from the same respondents.

### **Blind studies**

The concept of a **blind study** can be used with comparable and placebo experimental designs and is

applied to studies measuring the effectiveness of a drug. In a blind study, the study population does not know whether it is getting real or fake treatment or which treatment modality.

### **Double-blind studies**

The concept of a **double-blind study** is very similar to that of a blind study except that it also tries to eliminate researcher bias by concealing the identity of the experimental and placebo groups from the researcher. In other words, in a double-blind study neither the researcher nor the study participants know who is receiving real and who is receiving fake treatment or which treatment model they are receiving.



# CHAPTER 9

## Selecting a Method of Data Collection

### *Types of observation*

There are two types of observation:

1. participant observation;
2. non-participant observation.

**Participant observation** is when you, as a researcher, participate in the activities of the group being observed in the same manner as its members, with or without their knowing that they are being observed. For example, you might want to examine the reactions of the general population towards people in wheelchairs. You can study their reactions by sitting in a wheelchair yourself. Or you might want to study the life of prisoners and pretend to be a prisoner in order to do this.

**Non-participant observation**, on the other hand, is when you, as a researcher, do not get involved in the activities of the group but remain a passive observer, watching and listening to its activities and drawing conclusions from this. For example, you might want to study the functions carried out by nurses in a hospital. As an observer, you could watch, follow and record the activities as they are performed.

### *Advantages of a questionnaire*

- It is less expensive.
- It offers greater anonymity.

### *Disadvantages of a questionnaire*

- Application is limited.
- Response rate is low.
- There is a self-selecting bias.
- Opportunity to clarify issues is lacking.
- Spontaneous responses are not allowed for.
- The response to a question may be influenced by the response to other questions.
- It is possible to consult others.
- A response cannot be supplemented with other information.

### *Advantages of the interview*

- The interview is more appropriate for complex situations.
- It is useful for collecting in-depth information.

- Information can be supplemented.
- Questions can be explained.
- Interviewing has a wider application.

### *Disadvantages of the interview*

- Interviewing is time consuming and expensive.
- The quality of data depends upon the quality of the interaction.
- The quality of data depends upon the quality of the interviewer.
- The quality of data may vary when many interviewers are used.
- The researcher may introduce his/her bias.

## CHAPTER 12

### Selecting a Sample

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#### *Specific random/probability sampling designs*

There are three commonly used types of random sampling design.

1. **Simple random sampling (SRS)** –
2. **Stratified random sampling** –
3. **Cluster sampling** –

#### **Non-random/non-probability sampling designs in quantitative research**

1. **quota sampling;**
2. **accidental sampling;**
3. **judgemental sampling or purposive sampling;**
4. **expert sampling;**
5. **snowball sampling.**

#### *Quota sampling*

Let us suppose that you want to select a sample of 20 male students in order to find out the average age of the male students in your class. You decide to stand at the entrance to the classroom, as this is convenient, and whenever a male student enters the classroom, you ask his age. This process continues until you have asked 20 students their age.

#### *Accidental sampling*

This method of sampling is common among market research and newspaper reporters.

#### *Judgmental or purposive sampling*

The primary consideration in purposive sampling is your judgement as to who can provide the best information to achieve the objectives of your study. You as a researcher only go to those people who in your opinion are likely to have the required information and be willing to share it with you.

### ***Expert sampling***

The only difference between judgemental sampling and expert sampling is that in the case of the former it is entirely your judgement as to the ability of the respondents to contribute to the study. But in the case of expert sampling, your respondents must be known experts in the field of interest to you.

### ***Snowball sampling***

Snowball sampling is the process of selecting a sample using networks. To start with, a few individuals in a group or organisation are selected and the required information is collected from them. They are then asked to identify other people in the group or organisation, and the people selected by them become a part of the sample. Information is collected from them, and then these people are asked to identify other members of the group and, in turn, those identified become the basis of further data collection.

### **Systematic sampling design: a ‘mixed’ design**

**Systematic sampling** has been classified as a ‘mixed’ sampling design.

Suppose there are 50 students in a class and you want to select 10 students using the systematic sampling technique. The first step is to determine the width of the interval ( $50/10 = 5$ ). This means that from every five you need to select one element. Using the SRS technique, from the first interval (1–5 elements), select one of the elements. Suppose you selected the third element. From the rest of the intervals you would select every third element.

# CHAPTER 14

## Considering Ethical Issues in Data Collection

### **Stakeholders in research**

1. research participants or subjects;
2. researcher;
3. funding body.

### **Ethical issues to consider concerning research participants**

#### **Collecting information**

One could ask: why should a respondent give any information to a researcher? What right does a researcher have to knock at someone's door or to send out a questionnaire? Is it ethical to disturb an individual, even if you ask permission before asking questions? Why should a person give you his/her time? Your request for information may create anxiety or put pressure on a respondent. Is this ethical?

But the above questions display a naive attitude. The author believes that if this attitude had been adopted, there would have been no progress in the world. Research is required in order to improve conditions. Provided any piece of research is likely to help society directly or indirectly, it is acceptable to ask questions, if you first obtain the respondents' **informed consent**. Before you begin collecting information, you must consider the relevance and usefulness of the research you are undertaking and be able to convince others of this also. If you cannot justify the relevance of the research you are conducting, you are wasting your respondents' time, which is unethical.

#### **Seeking consent**

In every discipline it is considered unethical to collect information without the knowledge of participants, and their expressed willingness and informed consent.

#### **Providing incentives**

giving a small gift after having obtained your information, as a token of appreciation, is in the author's opinion not unethical. However, giving a present before data collection is unethical.

#### **Seeking sensitive information**

Certain types of information can be regarded as sensitive or confidential by some people and thus an invasion of privacy.

For most people, questions on sexual behaviour, drug use and shoplifting are intrusive. Even questions on marital status, income and age may be considered to be an invasion of privacy by some.

**The possibility of causing harm to participants**

It is unethical if the way you seek information creates anxiety or harassment, and if you think it may happen, you need to take steps to prevent this.

**Maintaining confidentiality**

Sharing information about a respondent with others for purposes other than research is unethical. Sometimes you need to identify your study population to put your findings into context. In such a situation you need to make sure that at least the information provided by respondents is kept anonymous. It is unethical to identify an individual respondent and the information provided by him/her. Therefore, you need to ensure that after the information has been collected, its source cannot be identified.

**Ethical issues to consider relating to the researcher****Avoiding bias**

Bias on the part of the researcher is unethical. Bias is different from subjectivity. Subjectivity, as mentioned earlier, is related to your educational background, training and competence in research, and your philosophical perspective. Bias is a deliberate attempt either to hide what you have found in your study, or to highlight something disproportionately to its true existence. It is absolutely unethical to introduce bias into a research activity. If you are unable to control your bias, you should not be engaging in the research. Remember, it is the bias that is unethical and not the subjectivity.

**Provision or deprivation of a treatment**

Is it ethical to deprive the control group of a treatment even if it may prove to be only slightly effective? And beyond the issue of control groups, is it ethical to deprive people who are struggling for life of the possible benefit, however small, which may be derived from a drug that is only under trial? As a researcher you need to be aware of these ethical issues. There are arguments and counter-arguments about these issues. However, it is usually accepted that deprivation of a trial treatment to a control group is not unethical as, in the absence of this, a study can never establish the effectiveness of a treatment which may deprive many others of its possible benefits. This deprivation of the possible benefits, on the other hand, is considered by some as unethical.

**Using inappropriate research methodology**

A researcher has an obligation to use appropriate methodology, within his/her knowledge base, in conducting a study. It is unethical to use deliberately a method or procedure you know to be inappropriate to prove or disprove something that you want to, such as by selecting a highly biased sample, using an invalid instrument or by drawing wrong conclusions.

**Incorrect reporting**

To report the findings in a way that changes or slants them to serve your own or someone else's interest is unethical. Correct and unbiased reporting of the findings are important characteristics of ethical research practice.

### **Inappropriate use of the information**

How will the information obtained from respondents be used by the researcher? The use of information in a way that directly or indirectly affects respondents adversely is unethical. Can information be used adversely to affect the study population? If so, how can the study population be protected? As a researcher you need to consider and resolve these issues. Sometimes it is possible to harm individuals in the process of achieving benefits for organisations. An example would be a study to examine the feasibility of restructuring an organisation. Restructuring may be beneficial to the organisation as a whole but may be harmful to some individuals. Should you ask respondents for information that is likely to be used against them? If you do, the information may be used against them, and if you do not, the organisation may not be able to derive the benefits of restructuring. In the author's opinion, it is ethical to ask questions provided you tell respondents of the potential use of the information, including the possibility of its being used against some of them, and you let them decide if they want to participate. Some may participate for the betterment of the organisation even though it may harm them and others may decide against it. However, to identify either of them is unethical in research.

### **Ethical issues regarding the sponsoring organization**

#### **Restrictions imposed by the sponsoring organization**

Most research in the social sciences is carried out using funds provided by sponsoring organisations for a specific purpose. The funds may be given to develop a programme or evaluate it; to examine its effectiveness and efficiency; to study the impact of a policy; to test a product; to study the behaviour of a group or community; or to study a phenomenon, issue or attitude. Sometimes there may be direct or indirect controls exercised by sponsoring organisations. They may select the methodology, prohibit the publication of 'what was found' or impose other restrictions on the research that may stand in the way of obtaining and disseminating accurate information. Both the imposition and acceptance of these controls and restrictions are unethical, as they constitute interference and could amount to the sponsoring organisation tailoring research findings to meet its vested interests.

#### **The misuse of information**

How is the sponsoring body going to use the information? How is this likely to affect the study population? Sometimes sponsoring organisations use research as a pretext for obtaining management's agenda. It is unethical to let your research be used as a reason for justifying management decisions when the research findings do not support them. However, it is recognised that it may be extremely difficult or even impossible for a researcher to prevent this from happening.

# CHAPTER 17

## Writing a Research Report

‘extremely valuable and interesting practical work may be spoiled at the last minute by a student who is not able to communicate the results easily’.

In addition to your understanding of research methodology, the quality of the report depends upon such things as your written communication skills and clarity of thought, your ability to express thoughts in a logical and sequential manner, and your knowledge base of the subject area. Another important determinant is your experience in research writing: the more experience you acquire, the more effective you will become in writing a research report.

The main difference between research and other writing is in the degree of control, rigorousness and caution required. Research writing is controlled in the sense that you need to be extremely careful about what you write, the words you choose, the way ideas are expressed, and the validity and verifiability of the bases for the conclusions you draw. What most distinguishes research writing from other writing is the high degree of intellectual rigour required. Research writing must be absolutely accurate, clear, free of ambiguity, logical and concise. Your writing should not be based upon assumptions about knowledge of your readers about the study. Bear in mind that you must be able to defend whatever you write should anyone challenge it. Do not use ornamental and superficial language. Even the best researchers make a number of drafts before writing up their final one, so be prepared to undertake this task.