SOCIAL RESEARCH METHODS I

Reading material

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Chapter 1- Introduction

1.1 Definitions

To be curious, to want to now something new, is part of the human nature. Even children are eager to explore the world around them. When something catches their eyes, they eagerly examine it by touching, observing and doing whatever on it. Research is thus a human activity which seeks to investigate and understand the universe. It is fundamentally prompted by human curiosity.

Social research is a scientific undertaking by which we investigate and understand social phenomena using logical and systematic techniques. It seeks to find explanations to unexplained social phenomena, to clarify the doubtful, and to correct the misconceived facts of social life. In other words, Social Research is a scientific undertaking that aims to:

1). Give description of social facts, events, and changes: in this regard social research enables us to answer questions beginning with what, where, when and how much.

2). Analyze casual connections and generate knowledge of understanding: social research, in addition to gaining factual knowledge, is also concerned with identifying causes for what has been observed by seeking explanations and by gaining understanding. It enables us to answer, questions beginning with 'Why … ?', and which can be summed up in statements beginning with 'Because … '.

3). Develop new scientific tools, and concepts which would facilitate reliable and valid study of social phenomena: in any kind of investigation the validity of results depends on the methods of investigation used, i.e., what is discovered depends not only on what is investigated, but also on what methods were used. Critical evaluation of any kind of discovery is impossible unless one knows how the results were arrived at. Thus, social research aims at the critical evaluation of existing research methods, their improvements and the development of new ones.

1.2 What Makes Social Research Scientific?

When it is claimed that social research is a scientific undertaking, you might wonder that what makes it scientific. Science is a way of investigating or discovering reliable knowledge about any phenomenon, be it social or natural. It is worth mentioning, however, that there are also other methods of discovering and obtaining knowledge. Fields such as art, literature, philosophy and religion make insightful and useful statements about the world, even though these statements are largely based on mere intuition and rational speculation. But science is the only method that results in the acquisition of reliable knowledge. Reliable knowledge is knowledge that has a high probability of being true, because its trueness is justified by reliable method. The method used to acquire and justify reliable knowledge is called a scientific method. The scientific method is based on three important principles:

1. the use of empirical evidence (empiricism)
2. the practice of logical reasoning(rationalism)
3. possessing skeptical attitude, or holding tentative conclusions (skepticism)

Empiricism: The Use of Empirical Evidence

Empirical evidence is evidence that can be observed through our senses: see, hear, touch, taste, or smell. Empirical evidence is important because it is evidence that others, besides you, can experience, and it is repeatable. So empirical evidence can be checked by yourself and/or others after knowledge claims are made by an individual. Empirical evidence is the *only* type of evidence that possesses these attributes and is therefore the only type used by scientists to make vital decisions and reach sound conclusions. Science holds that to know the world, observe it. The collection of empirical data using different methods of data collection is thus the hallmark of science.

Rationalism: The Practice of Logical Reasoning

The mere collection of empirical data is not sufficient by itself. The observations gathered must be logically analyzed and interpreted; and this is where rational reasoning enters the picture. Rational reasoning involves the logical derivation of conclusions from premises. For example, from the statement "people are motivated by self interest", we can logically deduce that "people will harm others if they see personal gain". Logic allows us to reason rationally, but most individuals do not reason logically, because they have never learned how to do so. Emotional thinking, hopeful thinking, and wishful thinking are much more common than logical thinking, because they are far easier and more congenial to human nature. Most individuals would rather believe something is true because they feel it is true, hope it is true, or wish it were true, rather than deny their emotions and accept that their beliefs are false. Statistics is a highly formalized system of logic providing rules specifying how conclusions can and cannot be drawn from numerical data. For example given that the statement 'X = Y' is true, the rules of mathematical logic tells us that the statement 'X/Z = Y/Z' is also true. Hence, statistical methods are employed for the analysis and interpretation of empirical data.

Skepticism: Possessing a Skeptical Attitude

Skeptics hold beliefs tentatively, and are open to new evidence and rational arguments about those beliefs. Skeptics are undogmatic, i.e., they are willing to change their minds, but only in the face of new reliable evidence or sound reasons that compel them to do so. They resist believing something in the first place without adequate evidence or reason, and this attribute is worthy of emulation. Science treats new ideas with the same skepticism: extraordinary claims require extraordinary evidence to justify one's credulity. Scientists remain open-minded. All knowledge is considered tentative, subject to change as new findings emerge from the international scientific community. Periodically, new results emerge that are contrary to what scientists in some field had accepted as established knowledge.

Nonscientific Sources of knowledge

Many other methods of gaining knowledge exist that claim to have factual knowledge about the world. Some even claim that their facts are absolutely true, something science would never claim. But their "facts" are not reliable knowledge, because they have not been justified by a reliable method. If such unreliable "facts" are true, we can never be sure that they are true, as we can with scientific facts. Such nonscientific sources of knowledge include:

- Traditional beliefs
- Beliefs based on authority
- Relying on experience

Traditional beliefs

Traditional beliefs are accepted as true simply because previous generations passed them on to the next generation as true. Traditional beliefs are not necessarily true or false; right or wrong; good or bad. From a social point of view, some traditional beliefs have positive results. Traditional medicines, based on local plants, have cured illnesses in many societies for generations. Other traditional beliefs, however, have negative effects. In some societies, women follow the belief of eating less than normal or, at least, not increasing their food intake during pregnancy. This practice is based on the belief that eating down will limit the size of the baby and, thus, avoids a difficult delivery. Female circumcision is a traditional practice believed to be important by most Ethiopians simply because it has been practiced by everyone since time immemorial in the past. People resist abandoning the practice even after knowing its harmful effects by empirical evidence. The fact that "everybody says" this or that is true is not a scientific basis for accepting what is true. Scientists base their *conclusions* only on what has been observed, and not on the basis of what is generally thought to be true.

Beliefs based on authority

Authoritarian beliefs rest on the fact that members of a group accept a statement as true because persons in powerful positions in the group say the statement is true. These persons may be tribal or religious leaders, elders, military officials, political leaders, teachers or scientists. Revelatory evidence or revelation is what someone says was revealed to them by some deity or supernatural power; it is not reliable because it cannot be checked by others and is not repeatable. Spectral evidence is evidence supposedly manifested by ghosts, spirits, and other paranormal or supernatural entities

It is, of course, impossible to receive an adequate education today without relying almost entirely upon authoritarian evidence. Teachers, instructors, and professors are generally considered to be reliable and trustworthy authorities, but even they should be questioned on occasions. Some authorities, like scientists or teachers, spend a great deal of time and effort to master a field of knowledge. We rely on these specialists to provide knowledge for our use. But even scientists sometimes disagree on certain points.

Relying on experience

Each of us has a variety of personal experiences as we grow up and interact daily with others. We not only learn from these experiences, but we also develop our own unique ways of processing these experiences in our brains. Through these processes, we reach conclusions about events all the time. For instance, based on your experiences with family members, friends and others, you may probably decide that most people are fair and honest. The expansion of your conclusion from the limited experience you have had with a relatively small number of persons to "most persons" is an example of forming a more general statement or what scientists call drawing a *generalization. In this case you are committing an error of over-generalizing.*

1.3. Types and Purposes of Social Research

First of all, why do we need social research? Ultimately, the objective of social research is to explore and gain an understanding of human behavior and social life in order to extend,

correct, or verify knowledge; whether that knowledge aid in the construction of a theory or in solving a practical problem. When research is done solely for the sake of gaining knowledge or satisfying our curiosity to know, it is termed "*pure" or "basic*" research. It is driven by the researcher's curiosity or desire to know something; as the famous Greece philosopher Socrates said "life without inquiry is not worth living." Pure research, like philosophy, is seeking knowledge for the sake of knowledge.

On the other hand, when research is made with the primary objective of the direct application of its findings to practical problems, it is termed as *applied* research or *practical* research. Applied research is meant to solve **practical problems**, rather than to acquire knowledge for knowledge's sake. One might say that the goal of the applied scientist is to **improve the human condition.** It is undertaken to solve an immediate practical problem. If for instance we have the objective of solving social problems such as poverty, unemployment or crime, we cannot do it unless we understand how and why they have come about through systematic and methodical examination, i.e., research. Some scientists feel that the time has come for a shift in emphasis away from basic research and toward applied research.

In reality, indeed, no sharp line of demarcation can be drawn between these two types of research. Theoretical knowledge is an essential element in solving practical problems, and applied research helps to generate theoretical knowledge. It is difficult to draw a clear boundary between these two types of research because research often yields results that have both theoretical and practical implications.

A common type of applied research is *evaluative research*, where researchers study the effectiveness of ongoing programs or policies to evaluate how effective they are in achieving their goals. In most cases of applied research, the researcher aims to be detached and not to affect or interfere with that which is being studied. But, in what is known as *action research* the researcher is actively involved in planning and introducing some change in policy, and then in using his/her research expertise to monitor its effects. In action research, the researchers are involved in devising programs, introducing them, and undertake research to monitor/evaluate outcomes. That is, the researcher is also the practitioner.

Research can also be classified based on the basic questions or problems that are meant to be addressed by the research. In this sense, any researcher tries specifically to perform three major tasks or purposes in his research endeavor: Exploration, Description and Explanation. On the basis of these three purposes, we can have three types of social research:

1. ***Exploratory research***.
2. ***Descriptive research***
3. ***Explanatory research***

Exploratory research

Exploratory research, as the name suggests, is a way of gaining some initial information about a problem or topic. You may be interested in a certain problem, but don't have enough information to write a clear research question. Perhaps you are not sure what methods of data collection may work best. Before beginning an investigation, you might decide to walk

around the problem by doing some informal interviews or by living for a short time with the group you want to study or a brief review of literature. We call that activity exploratory study. Exploratory studies can provide valuable, even critical, information for designing larger scale descriptive or explanatory studies. But exploratory studies do not provide satisfactory answers to research questions. One reason is that most exploratory studies are based on samples too small to permit generalizing the results to a larger population. Its purpose is to gain background information and better understand and clarify a problem. Exploratory research is basically conducted to:

- determine the best research design
- develop questions and/or hypotheses
- understand how to measure a variable
- determine data collection methods
- become familiar with the basic facts and people involved with the subject matter
- determine feasibility of doing further research

Exploratory surveys are different from pilot studies. The pilot study is a small scale rehearsal of a systematic survey aimed at testing questions, question flow, and questionnaire format with representatives of the target population. Exploratory surveys frequently are used prior to pilot studies to determine what concepts should be measured and how to measure them best

Descriptive research

Descriptive research is more specific and focused than exploratory research. The researcher starts with a well defined problem or research question and a clearly defined plan for collecting and analyzing data. Descriptive research is intended to produce clear, well-founded answers to some question or obtain specific, factual information. Descriptive studies aim to describe situations in detail. The researcher aims to have descriptive knowledge about the social world. That is, it is concerned with knowing facts, events and changes. It is the kind of knowing which grows out of, and enables us to answer, factual questions beginning with **what**, **where**, **when, and how much.**

Explanatory research

Explanatory research goes beyond exploratory and descriptive research by trying to find the reasons ***why*** certain things happen. It seeks to provide explanations for what has been observed. Explanatory research asks why things happen or exist as they do. It involves an examination of two or more variables simultaneously. We may ask why female students often score poorly in achievement tests than male students. Having posed such a question of explanation, we then suggest possible answers to the question. Our suggestions are termed as hypotheses. The statement of the research question points our research in a general direction but still leaves our task too large to accomplish. With the statement of specific hypotheses, our research focus is determined. A hypothesis is a simple declarative sentence stating a relationship between two variables.

As such explanatory research is concerned with identifying causes for some phenomena by seeking explanations and by gaining understanding rather than gaining factual knowledge. It is the kind of research which grows out of, and enables us to answer, questions beginning

with ‘Why …?’, and which can be summed up in statements beginning with ‘Because … ’ The question ‘why’ is usually more complex because it starts with the facts and seeks to explain them.

The different purposes of research that are given above have important implications on the kind of research methods that are employed in the study. Some research methods may be necessary for a certain question or problem and not necessary for others.

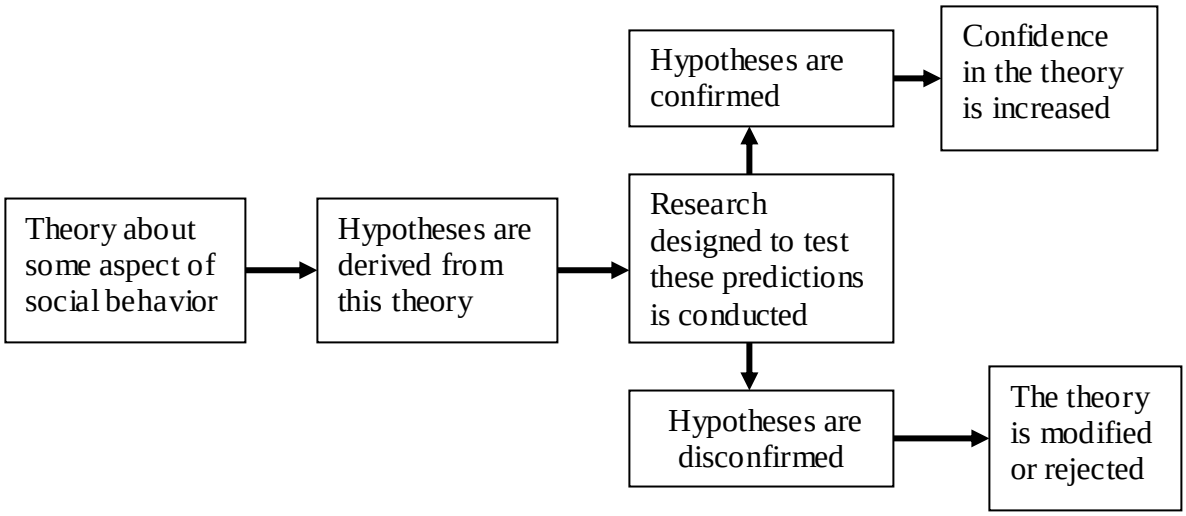
1.4 Theory and Research

Social scientists seek to do more than simply describing social phenomena. They also want to explain it. For instance they do not want to merely state that racial prejudice is common in the United States; they also want to be able to explain why some persons hold these negative views. This explanation involves the construction of theory. Theory is a set of logically interrelated propositions that attempts to describe, explain, and predict events. Further research can also be done to test the validity of the theory.

Theories are never proven in any final, ultimate sense. Rather they are always open to tests and are accepted with more or less confidence depending on the weight of available evidence. In a modern view of science, the facts, concepts and theories which make up scientific knowledge are neither permanent nor beyond dispute. They are much more like a report on progress so far, which future investigators may modify and even reject altogether. Any scientific theory is, to put it simply, the best agreed explanation which scientists have produced up to the present. Theories are not final and certainly not absolute truths. They are provisional, and are used until something is observed which contradicts them or which they cannot explain. When that happens to an important and influential theory, something rather like a scientific revolution occurs: an old theory may be discarded and a new one is invented, tested, discussed, negotiated, refined and eventually accepted, or rejected, by the scientific community. The truth of scientific knowledge cannot be taken for granted, and it is always open to question. This does not mean that science is simply guesswork. On the contrary: no observation, idea or theory should be accepted until it has been tested as thoroughly as possible. Remember, however, that testing ideas and theories can do no more than help us to decide whether our answers and explanations are good enough to accept *for the time being*, until a better idea emerges.

A scientific theory is, thus, a highly agreed with set of propositions that has been so repeatedly tested and for which so much reliable evidence exists, that it would be perverse or irrational to deny it. Figure 3 illustrates how theories are validated through research.

Figure 3: The Bearings of Social Research on Theory and the Vice Versa



1.5. Inductive and Deductive Approaches

The theory- research cycle consists of deductive and inductive approaches. The inductive approach (1) begins with empirical observation: namely the collection and analysis of data (2) generalizations are then made on the basis of the observation, and (3) the generalizations are logically fitted together and formulated as theory. For this reason research that follows the inductive format is sometimes referred to as theory-building or theory-generation research and the methods associated with it are known by the generic term, qualitative research.

A research that follows the deductive approach aims to validate or verify theory. This approach stars out from a consideration of theory and proceeds as follows: (1) theories generate hypotheses; (2) hypothesis lead to observation (data gathering); (3) observations lead to the formulation of generalizations; and (4) generalizations are used either to support the theory, to suggest modifications to it, or to refute it. Research that follows the deductive format is sometimes referred to as theory-testing research since its aim is to test the validity of a theory. Theory testing research as rule employs quantitative method.

In the process of searching explanations for research questions, a researcher generally falls back on previous observations made by him or others. Aided by these observations and some cursory knowledge he may have about the problem, he tries to identify those significant factors, which may throw light on his question. By shrewd guess or profound hunch he tries to establish causal relationships between various sets of facts at hand. This provisional explanation which becomes the basis for systematic investigation is known as ***hypothesis.***

In other words, the researcher must choose those significant and relevant facts which will most adequately explain the problem under study. In his search for the significant facts, he may fall back to previous experience through literature search or his own personal knowledge. This process of deriving hypotheses from a priori knowledge is called ***deduction or deductive***

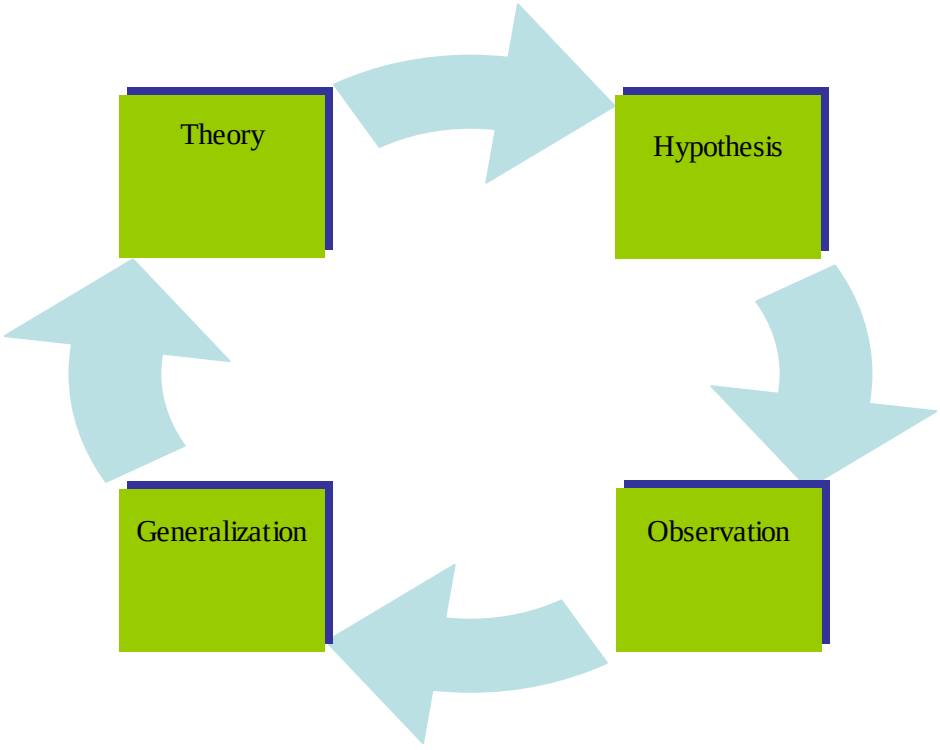
reasoning. Deduction is a process used to derive particular statements (hypotheses) from general statements or theory. A hypothesis is deduced from a theory and is tested by comparison with relevant data. If the data do not agree with the hypothesis, the theory is rejected as false. Testing such a hypothesis is assumed to be a test of the theory itself.

The formulation of hypotheses gives definite point to the inquiry, aids in establishing direction in which to proceed and helps to delimit the field of inquiry by singling out the pertinent facts on which to concentrate, and by determining that which facts should be put aside.

After repeated, scientific observation or research, hypotheses can be verified and generalizations arrived at. This generalization after verification of hypotheses is called ***theory*** .The process of formulating theories from empirical generalizations is referred to as **induction or inductive reasoning**. Induction is a process of moving from particular statements to general statements. It is used to produce theory from data. Many specific instances are used to produce a general conclusion that claims more than the evidence on which it is based. That is, in induction, generalizations are made for a population based on data obtained from a sample**.**

It should be remembered that induction and deduction are inseparable parts of a system of reasoning. We arrive at a proposition ***deductively*** by logical operations from the established, known, or self-evident facts or theories. On the other hand, we arrive at the facts ***inductively*** by observing and testing individual cases.

Figure 4: The Sociological Investigation as a cyclical process.



1.6 Causation and Correlation

The central ambition of social research is to discover causes for social phenomenon. We would like to answer causal questions such as: what is the cause for unemployment in this town or overpopulation? What makes people to have large or small family, or to break marriages or to commit suicide? A causal relationship between two variables is a situation in which a change in one variable (independent variable) produces change in another variable (dependent variable). Consider an example: *a rise in price causes a reduction in consumption*. The causal mechanism that links the two variables (price and consumption) is the choices of rational consumers who observe the price rise, adjust their consumption to maximize overall utility, and reduce their individual consumption of the good in question. This rational behavior at the individual level produces the effect of lower aggregate consumption. We say that X caused Y where:

- There is a strong statistical correlation between X and Y
- X is temporarily prior to Y
- X is a necessary and/or sufficient condition of Y, (if X, then Y; and/or if X hadn't occurred, Y would not have occurred)
- There is a causal mechanism leading from the occurrence of X to the occurrence of Y

The establishment of cause and effect relationships between variables is one of the most difficult tasks in research methodology. It might seem that when two variables are closely related, one must be the cause of the other, but this is not always true.

Discovery of a relationship alone does not explain why the variables are related. Providing an explanation for an association requires additional understanding of how one variable, taken as the dependent variable, interacts with the independent variable. Thus, any time you discover a relationship between two variables you are forced to think about why the relationship exists.

You can say that the two variables are related and that is all. Sometimes it is impossible to say which variable influences the other. We only know that the two variables are related. Without more information, we cannot say that one of the variables is the cause of changes in the other variable. Even so, such limited findings may be useful to other researchers. With an observed correlation or association, all one can say is that the two variables are related and nothing more. The relationship doesn't tell us whether one variable causes changes in another.

Once a strong correlation is found between two variables, we have then to decide on the direction of a possible causal relationship. That is, which is to be considered as the independent and which as the dependent variable? In assessing the cause or causes which explain a correlation, we need to distinguish independent variables from dependent variables. An *independent variable* is one which produces an effect upon another variable**;** the variable affected is the *dependent* one. Establishing a possible direction of a causal relationship is based on a simple rule: *The variable thought to be the independent variable must precede the dependent variable in time***.**

In addition to establishing the time sequence, we have to make sure that the observed relationship cannot be explained by the influence of any other variable that could cause changes in either the independent or dependent variables. *That is, if the independent variable occurs, the dependent variable also occurs; and if the independent variable doesn't occur, the dependent variable would not occur.*

Finally there should be a causal mechanism between the independent and dependent variables. *A causal mechanism is the sequence of events or conditions, governed by lawlike regularities, leading from the cause to the effect*.

Perhaps you now see how difficult it is to claim you have discovered a causal relationship. We can never collect data on all the variables that might affect some dependent variable we are studying. Therefore, we can never know all the relationships that may exist between a dependent variable and other variables. Recognizing this fact, researchers are extremely cautious in making cause and effect statements. We will discuss more on causation and correlation later in section *3.2 experimental studies*.

Chapter 2 -The Research Process: A Sequence of Stages

Research generally follows the sequence of stages shown in **Box 2.1**. First, a researcher begins by selecting a topic and stating the problem or research question he or she intends to investigate and then proceeds through each of the remaining stages. The *review of the literature* consists of identifying and analyzing research reports bearing on the research question. Then the researcher prepares a research *design* for the collection and analysis of data. The next step consists of *data collection,* using the measuring instruments developed in the design phase. After data collection, data a*nalysis* follows, which produces the *results* or *findings* of the study. Based on the results obtained, a researcher then provides an *interpretation* of what the results mean. The interpretation of the findings leads to the *conclusions* of the investigation. The final stage consists of writing a report that describes the decisions and actions taken throughout the entire process. Let us now discuss each of the steps in some detail.

Box 2.1. Stages in the research process

1. *choosing a topic*
2. *stating the research problem*
3. *reviewing the literature*
4. *preparing the research design*
5. *collecting the data*
6. *analyzing and interpreting the data*
7. *preparing the final report*

2.1 Choosing a Topic

Research starts with getting an initial idea about something to investigate. You may begin with a "topic" or a "problem" that interests you. Topics, problems, or questions for research can come to you at anytime and from a variety of sources. Course work is an obvious and frequent source of research questions. You may be stimulated by something an instructor says or by something you have read.

Research problems come up as part of on-going work; one research project may easily lead to another, because it raises issues which the researcher had not previously considered. Puzzles may also be suggested by reading the work of other researchers in books and professional journals, or by an awareness of specific trends in society from everyday life experience

Frequently, things mentioned as "problems" by friends or relatives or something you read about in a newspaper or magazine can be rephrased as a question for study. In addition, your own personal experience or interests may lead you to do research on a certain problem. A student from a religious or ethnic minority group may be motivated to investigate attitudes or behavior of the majority group toward the student's group. A student from a rural area may want to investigate ways of improving social services in his or her village.

In choosing your research topic keep the following points in mind:

- Personal interest and ability.
- Availability of resources
- Significance of the issue /problem

The choice of research topic is influenced by the interest of the researcher and by the context in which the research is to be done. But this does not mean that the research is biased. Just because researchers have strong feelings about what they are investigating, it doses not automatically follow that their findings will be slanted in favor of their own beliefs and values. Indeed, this is a major difference between social science and journalism. The social scientist must conduct a fair and balanced enquiry, not allowing personal or political values to affect what is discovered and reported. Values will influence the choice of topic, as do in all branches of science, but methods should be value–free. As a person, you can be interested in a certain problem and want to do research on it, but, as a researcher, you will want to do the research as honestly as you can and be ready to accept whatever results occur.

But your personal interest alone is not enough. You have to consider the availability of resources necessary to accomplish the research work. How much time do you have to complete the study? Do you have the financial capacity to complete the research? Do you have access to office facilities? If you are working library research, do you have access to relevant and up-to-date materials? Go to the library and check. If you are working field research, where do you get the data? How and when? If you decide that the project will take too long or cost too much, you will have to reduce its scope or find a question you can investigate within your time and financial resources. To avoid confusion and superficiality, and to promote clarification, it is necessary to keep research within manageable limits. Your topic should have limited coverage in time, place and population size to be accomplished by available resources. A good research topic should be feasible.

Significance of the issue or the problem *refers to judging how* important the issue is? Is it really worth doing research on such a topic? Is it reasonable to spend scarce resources and your precious time on the issue? Is the issue current and timely? Does the problem or the issue have significant scientific relevance? Does it have broad social, economic, political implications? Does the problem affect large number of population? What is the significance and relevance of your topic for other people apart from your personal interest on it? Is it already studied by other researchers?

2.2 Statement of the Research Problem

Any research is supposed to begin with asking a meaningful question or identifying a significant problem. A researcher thus should, at the beginning, be able to state the problem or the question in a way that it is conceivably possible to answer it. Any attempt to gain knowledge must start here. *A research problem* may sometimes be an area of factual ignorance. We may simply wish to improve our knowledge about certain institutions, social processes or cultures. The researcher might set out to answer questions like: What proportion of the population holds strong religious beliefs? How far does the economic position of women lag behind that of men? The answers would be mainly descriptive, *hence descriptive research*.

Most often than not, however, social research deals with problems which are also *puzzles*. A puzzle is not just a lack of information, but a gap in our understanding. Descriptive research simply answers the question: "What is going on here?" Puzzle-solving research tries to contribute to our understanding of **why** events happen as they do, rather than simply accepting them at their face value. Thus we might ask why patterns of religious belief are changing. What accounts for the rise of decentralized forms of government' in politics in recent years? Why women are so poorly represented in high- status jobs?

The statement of the problem refers to a clear formulation of the research problem which can then precisely be stated in the form of research questions and/or hypotheses. Research questions state the research problem in a form that can be investigated and define the nature and the scope of the research. The formulation of the research questions helps to define the direction and focus of the research. A hypothesis is an informed guess or tentative answer to the research question which has to be confirmed or falsified by the research.

2.3 Reviewing the Literature

This is the process of exploring the existing literature to ascertain what has been written or published on your area of interest, and how previous research has been conducted. Review of literature:

- Should increase your knowledge of the subject area and the application of different research methods
- Will help you to focus on your own research topic, develop and support it (defining the research problem).
- Will help you to determine whether your intended research project is feasible. If not, you may have to amend it in some way or even seek a new project.
- Helps you to explore what others have contributed to your area of interest
- Helps you to find out what is already known and to identify gaps
- Shows that you are familiar with literature on your topic

Literature review is an important part of any research activity and should provide the background and justification for your research project. It will be written up as part of your proposal and will become one of the early chapters in your final research report. In reviewing

literature, it is not sufficient to describe other research studies which have taken place. You need to appraise critically the contributions of others, and define any areas of weakness.

The practice of literature review is not limited to a certain stage of the research process. Every stage in the research process from the formulation of the research topic to the final write-up of the report involves reviewing the literature and systematically organizing what is already known in the field. At each stage of the research, you will need to search for and apply knowledge related to the tasks you are doing at that stage. At the beginning, you will want to review the research literature so you can place your research in the context of previous research; at the design stage, you will want to look at how previous researchers designed their research. When you analyze your data, you will want to see how others did analyses similar to the ones you are planning to do. The same point holds when you prepare to interpret your findings and develop your conclusions. What did other researchers on topics similar to yours find? How did they interpret their findings? What conclusions did they draw? In this way, researchers constantly review and draw upon the accumulating body of social science information.

Further, most if not all researches by university students are based on the analyses and critical examination of documentary materials with little or no fieldwork at all. Many course assignments including critical essays, term papers, research proposals and project seminars are all based on critical review of literature. Thus review of literature, the analysis and critical examination of documentary sources, is an important aspect of any research project. Let us consider now some points that would hint on how to locate and analyze documentary materials.

Exploring Sources

Go to the library and check the availability of materials related with your subject. Consult the librarians and know the location of sources and library systems. The librarians can be of great help and provide you useful information as to how and where to get sources that you would otherwise not know. Refer to the card catalog of the library. Today, most catalogs of university libraries can be viewed online from a computer terminal. If your university library has an online catalog, searching for titles of books related to your research question is relatively easier than using the card catalog.

Apart from your university library**, o**ther libraries near your university may be worth exploring. The library of another university may have materials your library does not have. Many government ministries and research centers maintain libraries that contain not only all the public documents of the organization, but also reports of international organizations. For some research topics, these specialized libraries may be the best sources of information.

In the process of identifying potentially useful sources of information, you will discover articles, books and research reports, and possibly information on Web sites. As you start the actual review process, your first task is to decide which sources to examine in detail. The following points will help you save much time:

- Focus on material directly related to your research question

- Learn to read critically: look for materials that tell you something new about the topic you are investigating
- Take clear and comprehensive notes
- Prepare a complete, accurate reference for each source used

Focusing on relevant material
Reading everything that comes into your hands leads to a great waste of time and prevent you from finding and learning from really useful material. Before starting, therefore, it is a good idea to set some limits on what you are going to try to get. Look first for material that relates to the central concepts or terms in your scope of interest. Second, decide how far back in time you intend to search. Start with the most current publications you can find and work back until you don't find anything new or particularly valuable.

When you find a publication that looks promising, first read the *abstract,* if the publication has one. If an article does not have an abstract, turn to the summary at the end of the articles and read it. Then read the introduction or the review of literature section. If these sections indicate the report has information related to your interest, then read the whole report critically and take notes on the points most valuable to you.

Learning to read critically
The key to analyzing publications and to preparing a review of literature is to read critically. Publications vary greatly in quality. Many publications meet the highest standards of research and scholarship: Unfortunately, others do not. If you suspect that the methods of data collection and analysis are weak, you can probably disregard a report. As you read, be alert to references to other publications. For new references, first examine the title and decide whether you think it might contain information useful for your study. If you think it does, copy down the reference on a note card for use in finding the publication. Continue this process until you run out of new leads. Also, try to learn as much as you can from each publication you read. The authors of each report you read dealt with the same things you will face in planning and carrying out your study. Learning how authors handled these points can help you at every stage in your own research, from stating your research question to writing your report.

Take clear and comprehensive notes
When you take notes, using note cards or the same size paper for all notes will help you organize your notes easily. On each card write only a specific idea from a single publication only and put the theme of the note as its title. Write also on the same card the author's name, year of publication, title of the book, the publisher and page numbers from which you have taken the notes. This will help ensure that you get all the information you need at one time, and save you from having to find a publication a second or third time to get information you need for writing your research report.

Take notes in the form of direct and/or indirect quotations. A direct quotation is an exact copy from the original text. You can quote words, phrases, sentences and paragraphs. It is used to keep the original wording and diction, in order to show that you have not changed the author's idea. This is especially important when the idea is controversial or when you want to emphasize that it is not your idea, or when the expression is vague to summarize and

paraphrase. Any way you must have reason to quote directly, otherwise direct quotation is the symptom for the writer's laziness. Always try to make your direct quotations as short as possible. Very long direct quotation destructs your intellectual dignity and quality of your research. If you want to quote more than three lines, use indentation. For short quotations not more than three lines, use **"quotation marks"** Use ellipsis (**three dots**) when you wish to shorten a quotation by eliminating unnecessary words or phrases. You can also insert an **[interpolation]** when you think that there is something missed, incorrect or unclear point as:

- "During that period **[the cold war]** the threat of nuclear was serious."
- "The difference between urban **[and]** rural is blurred."
- "She is the son of **[sic]** a rich merchant."

Look at the example of a long direct quotation given in Box 1.2., and note the use of **interpolation and ellipsis**. Note also that the source of the quotation is cited within **(parentheses)** at the end, citing the author's name, year of publication and page numbers. A citation is an in-text acknowledgment of sources from which you have obtained the information.

Box 2.2. Long Direct Quotation

The growing concentration of the poor in urban centers makes the provision of housing and related services extremely expensive. Therefore, the issue of housing appears at the top of the long list of urban problems, and housing production becomes one of the first and most important economic activities in the process of rapid urbanization **(World Bank, 1993; UNCHS, 1987)**. The World Bank has explained the challenge of the housing problem in developing countries as follows:

> ***[Between 1950 and 1990]*** *the urban population of developing countries had more than quadrupled growing from 300 million to 1.3 billion people.* ***…*** *Each year, some 12 to 15 million new households are added to the cities of the developing world. The high costs of land, infrastructure and building materials in the cities, relative to such costs in rural areas, ensure that the economic dimension of the housing challenge will continue in urban areas* ***(World Bank, 1993:11****).*

You can also quote indirectly by summarizing and paraphrasing. A summary is a condensed statement of the original text in your own words and style while paraphrasing is the restatement of the original text with the same detail but with your own words and sentence construction. In indirect quotation, there must be conceptual similarity between the original text and your note. Do not distort the basic idea of the original source. Re-arranging words and imitating writing style or diction is forbidden. Even a single key word should be quoted directly. In both direct and indirect quotation cite the sources as indicated in the box above. Failure to acknowledge sources is termed in academics as *plagiarism*. Plagiarism is the use of

other person's idea and wording without giving appropriate credit. Plagiarism has both academic and legal punishment. It is a serious crime in academic world. To avoid plagiarism, you should give credit to every idea you take.

2.4 Working Out a Research Design

A research design is a plan of data collection methods and tools as well as analysis procedures that would enable you achieve the purpose of your research. A range of different research designs exist, and which is chosen depends on the overall objectives of the study, and the availability of resources as well as the subject matter of the research. In line with the objective of the research you might need to use survey designs, experimental, quasi-experimental or observational designs. Designs generally define the units of analysis, coverage and time reference of the study (discussed in a more detail in chapter 4).

2.5 Carrying Out the Data Collection

One must next gather relevant information to attempt to answer the question or solve the problem by making observations. These observations, and all that follow, must be empirical in nature--that is, they must be sensible, measurable, and repeatable, so that others can make the same observations. Great ingenuity and hard work on the part of the researcher is often necessary to make scientific observations. Furthermore, a great deal of training is necessary in order to learn the methods and techniques of gathering scientific data. At the point of actually doing the data collection, unforeseen practical difficulties can easily crop up. It might prove impossible to contact some of those to whom questionnaires are due to be sent, or whom the researcher wishes to interview. A business firm or government agency, for example, might be unwilling to let the researcher carry out the work planned. Documentary materials might prove much harder to trace than was originally envisaged. Here you may consider some modification of your research design as the real situation in the field demands. This is particularly true for qualitative researches.

2.6 Analyzing and Interpreting the Data

The data gathered have to be analyzed and brought to bear on the problem which prompted the study. Working out the implications of the data collected, and relating these back to the research problem, is not an easy task. While it may be possible to reach a clear answer to the questions with which the research was concerned, many investigations are in the end less than fully conclusive. The purpose of analyzing and interpreting is to answer the research questions or to prove/disprove the hypothesis. If you are not able to conclude, state the limitations of the data that prevented to do so. In quantitative research, data analysis involves descriptive and inferential statistics. Descriptive statistics deals with univariate analysis such as proportions, percentages, ratios, rates central tendencies, frequencies, and bivariate/multivariate analysis involve correlation/association, regression, ANOVA, etc. Inferential statistics involves statistical estimation and hypothesis testing. Qualitative analysis is less formal and highly flexible and gives more authority to the researcher to use his talents.

2.7 Writing the Final Report

The research report usually published as a journal article, a book or a thesis for academic fulfillment, provides an account of the nature of the research, and justifies the conclusions drawn. This is a final stage only in terms of the individual research project. Most reports indicate the questions which remain unanswered and suggest further research that might profitably be done in the future.

The purpose of report writing is to communicate the findings or results of your research. In order to achieve this, your report should have the capacity to convince readers and should not be offensive or biased. Take enough time to write the report. Remote preparation is necessary, digest the idea, and think again and again. The text should be written as lucidly and clearly as possible. The grammar, punctuation and spelling should be correct. Although spelling, grammar and punctuation play an important role; writing is more than a mater of correct usage. It involves a careful choice of words to create the interests of the reader. You should aim to present your report in a way that invites the reader to start reading and easy to flow through. By virtue of your writing style, the reader can be forced to read.

It is always desirable for you to create an outline of the paper based on the component parts and filling in the major points you want to cover in each part. The outline of the paper refers to the structure, i.e. the sequence in which you present each type of information. The scientific report should have distinctive and clearly evident component parts. This will organize your thoughts and will make the writing process less painful. The more logical you can make your outline format, the easier it will be for you to write and for the reader. A Typical research report can have the following format:

1. Introduction: A precise description of what the research is about, and why it is important and interesting. The research objectives, questions and hypotheses should be stated clearly and briefly.
2. Methods/ procedures: An explanation of what data you collected and the methods used, from where you collected them, how you analyzed the data. The information provided should be as detailed as possible, so that other researchers with similar interests might replicate your procedure and conduct another study in a similar line.
3. Literature review: A critical analysis of what other researchers have said on the subject and where your project fits in.
4. Results and discussion: A presentation of your research data using tables, graphs and charts, and the analysis of your results showing the contribution to knowledge building and pointing out any weaknesses /limitations
5. Conclusion: A description of the main lessons learnt from your study, and the areas that need further research.
6. References: An alphabetical list of the sources from which information has been obtained and which have been cited in the text.
7. Appendices: Detailed data referred to, but not shown elsewhere& data collection instruments.

A good research report has the qualities of adaptability, readability, objectivity, consistency and proximity. **Adaptability** refers to the clear communication between the reader and the writer. Readers should understand the report in the same way the writer does. The writer should visualize the readers mind. Think how much the readers know about the idea (how do they think and understand). Use technical language if the audience is advanced, or otherwise give definition of technical terms as a glossary. After writing, read, re-read and understand clearly. The title of the report should reflect the content of the text. A good report is like putting a fact in front of people. Use short sentences, simple words, and active voice as much as possible .It should not be boring and redundant. Good research report requires good language skill.

Readability: Be sure that your handwriting is readable. Try to avoid errors and difficult words in your writing. The meaning of words should be checked for correct usage. Proofread your report for typographical mistakes, repetition, errors and omissions .The grammar, punctuation and spelling should be checked. The page layout of the report should be appealing using appropriate margins, fonts and line spaces. You should do every thing you can to make it easy for the reader to follow your writing. Highly complex arguments; confused structure and technical terminology make communication difficult.

Objectivity refers to focusing on existing facts only; Keep yourself within the framework of the evidence at your hand. Avoid emotionality and belongingness or bias in your writing. Write based on objective data rather than on assumptions and religious, political ethnic or whatever belongingness. If your report is biased, it will harm your trustworthiness.

Consistency: Be sure that you are logically and grammatically correct. Keep your self-consistent and logical. Try to state parts clearly and/or present information intelligently. There should be smooth flow of ideas. What comes first and what comes next should be logically arranged. Logical connection between sentences, paragraphs and sections is important. Keep in mind that you want the paper to flow well.

Proximity: Keep yourself near to the topic under discussion. Concentrate on the main topic of the report. Discuss relevant and related issues only. Give emphasis or power to the most important ideas of the topic. Ask yourself. "What is the main point I want to establish?" Simply, do not go around the bush.

2.8 The Overall Process

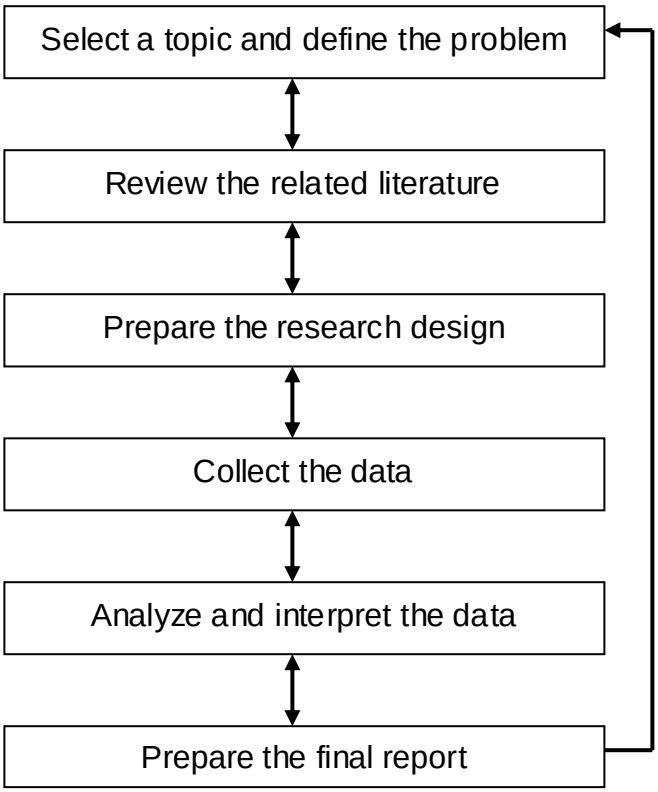
The preceding sequence of steps is a simplified version of what happens in actual research projects. In real social research, these stages rarely if ever succeed each other so neatly, and there may be a certain amount of sheer muddling through. The difference is a bit like that between the procedures outlined in a recipe book and the actual process of cooking a meal. People who are experienced cooks might not work from recipe books at all, and their work is often much more creative than those who do. Figure2.1 indicates this clearly.

Notice that the arrows connecting the stages are bi-directional: They point in both directions. Although an investigation normally proceeds from the definition of the research problem or question to the review of the literature and on to the next stage, unexpected problems almost always come up. Some of these may be serious enough to require going back to an earlier

stage for rethinking some earlier decisions. For example, a researcher may select a certain problem and move on to the review of the literature only to discover that the planned research has already been done. Then, the researcher has to start again. At the design stage, researchers sometimes find that additional measures are needed for the variables they wish to investigate. This too can lead the researcher back to the literature for new ideas. This kind of back and forth movement occurs at all stages of research.

As a beginning researcher, you may have a false start or have to abandon your initial idea after you get into your project. If this happens, don't despair. Consider it as a learning experience. Also, be sure that this back and forth process is common in research. All researchers, even those with a lot of experience, go through this iterative process. With experience, however, the process becomes easier.

Figure2.1: Steps in the Research Process



Chapter 3. The Different Methods of Social Research: An Overview

3.1 Quantitative vs. Qualitative Methods

The phrase '***research methods'*** refers to a set of systematized techniques, principles, and procedures that are applied in any scientific inquiry. In the social sciences, there are different research methods for different purposes and subject matters. However, all the different social research methods can grossly be classified in to two major divisions. These are *Quantitative and Qualitative methods*

Quantitative social research methods are rooted in the philosophy of Sociological positivism which was developed during the early nineteenth century by Auguste Comte (1798 – 1857). Comte, in his positive philosophy, advocated the application of natural science methods for the scientific study of society, i.e., sociology. He emphasized on the development of sociology as an objective science involving the establishment of social laws, experiment, and elimination of subjectivity and speculation in social analysis. He thought that empirical methods and statistics as applied in the natural sciences could also be applied in the analyses of social phenomena. In 1822, he coined the term "social physics" as an objective science of society, which he latter called sociology. In a sense, sociological positivism is an attempt to imitate and apply the methods of natural sciences in social science research. Emile Durkheim (1858 – 1917) claimed sociology to be an objective science of social phenomena (social facts) conforming to the model of natural sciences. Social facts, the subject of social science, can and must be observed and explained in a manner scientists do for physical phenomena. Quantitative researchers emphasize on value neutrality, implying that the social scientist should not make value judgments, observe social facts as things in the same way natural scientists observe physical objects and events. Experiments, surveys and document analysis are the prototype of the quantitative research methods, and *statistics* the principal tool in quantitative research.

Qualitative research on the other hand seeks to grasp the meanings which individuals or groups assign to their ways of life, their beliefs or actions. Here, researchers try to understand or apprehend the subjective meanings of social phenomena from the point of view of specific social groups. The assumption behind qualitative research is that social reality is subjective, rather than objective as positivists claim, and the role of the researcher is to understand the subjective meaning of social reality as perceived by the consciousness of the subjects.

Qualitative methods are based on the assumption that the methods of the natural sciences could not be applied for the study of social phenomena. There is the need to develop methods that fit the unique characteristics of social phenomena which are hard to grasp by methods used in the physical sciences. Common qualitative research methods include participant observation, focus group discussion, life histories & case studies. Qualitative researchers describe all their observations and generate hypotheses rather than trying to test hypotheses, and emphasize on meaning rather than quantity. Both quantitative and qualitative methods have their own strengths and shortcomings. Thus, it is advisable to use both methods as the situation demands.

Table 1: Comparison of the Two Methodologies

Quantitative	Qualitative
• Tends to produce numerical data • Uses large samples • Concerned with hypothesis testing • Data are highly specified and precise • Reliability is high • Validity is low • Measures variables • Assumes objectivity • Deductive	• Tends to produce qualitative data • Uses small samples • Concerned with generating theories/hypothesis • Data are detail and subjective • Reliability is low • Validity is high • Describes subjective meanings • Assumes subjectivity. • Inductive

Now, before turning to the discussion of the various quantitative and qualitative methods, let us see briefly the bases on which one or the other method is selected for a specific research project. The different purposes of research that are discussed earlier have important implications on the kind of research methods and procedures that are employed in a study. Some research methods may be necessary for a certain purpose and not necessary for other purposes. Besides, the choice of one or the other method for a specific research project depends on the merits and/or demerits of the methods with regard to three important requirements: these are *reliability, validity, and representativeness of the method*.

1. RELIABILITY: If a method of collecting evidence is reliable, it means that anybody else using this method, or the same person using it at another time, would come up with the same results. That is, the research could be repeated, and the same results would be obtained. For example, an experiment in a chemistry lesson should always produce the same result whoever is doing it, at whatever time, provided that the proper procedures are followed and the phenomenon under investigation remains the same. Some methods of social research are regarded as being more reliable than others. Any method that cannot be repeated is always in danger of being thought unreliable.

2. VALIDITY: Validity refers to the problem of whether the data collected is a true picture of what is being studied. The problem arises particularly when the data collected seems to be a product of the research method used, rather than of what is being studied. Suppose we were making an enquiry into people's leisure habits. If we designed a questionnaire to ask people what they did in their free time, how would we know whether the answers we received give us a true picture of how they spend that time? This is not just a matter of people telling lies. They may genuinely believe what they are saying, but actual observation of what they do might well produce a different picture. This is particularly relevant in attitude surveys, where it is important not to assume that people's expressed attitudes, on say, race relations, are consistent with their actual behavior.

This is always a nagging doubt about any survey- style research. It must be accepted that what we are collecting is people's answers to questions, which is not necessarily a true picture of their activities. In laboratory experiments, we may be getting a picture of how people behave in laboratories, but can we be sure that this is how they behave in the real world?

3. REPRESENTATIVENESS: This refers to the question of whether the group of people or the situation that we are studying are representative so as we may generalize from the sample that we have studied. If we do not know whether they are representative, then we cannot claim that our conclusions have any relevance to anybody else at all. Careful sampling methods have been devised to try to ensure representativeness in survey research, but many other methods do not involve systematic sampling, and there must always be a question as to the representativeness of their findings and conclusions.

Now, let us turn to the discussion of each of the various methods of social research one by one but briefly. The common methods that we discuss next are: sample survey, experiments, documentary research, participant observation, focus-group discussion, case studies, life histories, diaries and conversation analysis.

3.2 Sample Survey

A Survey is a research method whereby *a sample* of study cases are selected and studied to make inferences about the population from which the sample cases were selected. The premise of survey research is the assumption that the best way to gather certain types of data is by *asking questions*. Thus, once you have decided to use survey method, you have to make decisions about:

1) What questions to ask and how to administer the questions (questionnaire design)
2) Whom to ask or whom to survey (sampling)

Questionnaires:

Two sorts of questionnaire are used in surveys, *close-ended questions and open-ended questions*. The former types have a standardized (pre-coded) set of questions, to which only a fixed range of responses are possible. Either the respondents or the researcher mark certain categories of reply to the questions asked- like, Yes, No, Don't Know. Fixed-choice surveys have the advantage that responses are easy to compare and tabulate, since only a few categories of responses are involved. On the other hand, because they do not allow for detail opinions or verbal expression, the information they yield is likely to be restricted in scope.

Open-ended questions, in contrast, give opportunities for respondents to express their views in their own words. They are not limited to ticking fixed- choice responses. Open-ended questionnaires are more flexible, and provide richer information than standardized ones. The researcher can follow up answers to probe more deeply into what the respondent thinks. On the other hand, the lack of standardization means that responses may be more difficult to compare.

Survey questions have to be carefully constructed if the results are to be useful. A question like "what do you think of the government?" is worthless because it is much too vague. If respondents were able to answer it at all, they would interpret the question in many different ways. There are many sources of possible distortion or ambiguity in the framing of questions. For instance, a question may state a double choice: Is your health better or worse now than it was a year ago? The double choice is between better- worse' and now-then'. A clearer formulation would be. Is your health better now than it was a year ago? Questions should be as simple as possible so as to avoid ambiguous responses. All the items have to be readily understandable for interviewer and interviewees alike. The terms with which the researcher may be working might be unfamiliar to the respondents: for instance, the question "what is your marital status?" might be received with some confusion. It would be more appropriate to ask, "Are you single, married or divorced?" Most surveys are preceded by pre-testing of the questionnaire in order to tackle problems which are not anticipated by the investigator initially. A pre-test is a trial run in which a questionnaire is completed by just a few people. Any difficulties found can be ironed out before the main survey is done.

Sampling

Sampling is a systematic selection of some cases or study units from a given population. When the study population is large; it would be too expensive and time consuming to collect data from all members of the population. It is more economical and efficient to base studies on samples. For most practical purposes, the conclusions drawn from the analysis of data collected from the sample can be just as valid as conclusions drawn from the analysis of data collected from the entire population. To this purpose, it is necessary to ensure that your sample is representative of the population. When the sample is selected, it is assumed that it represents the population for which it stands. Failure of this is failure of the entire research work.

But, how can we ensure the representativeness of a sample? We can do this by applying sampling principles and procedures. Statisticians have developed different sampling methods to select a representative sample. Statistics can be defined as an inductive science dealing with methods of selecting a sample from a population, analysis of sample data, and drawing valid inferences about the population. In dealing with a sample, we take a short time, spend small amount, and commit lesser mistakes in collecting information than in dealing with the entire population since we contact limited study units. But if the sample is not representative of the population, it is quite possible we get a biased estimate of the population. The main objective of sampling procedure is to secure a sample which will reproduce the characteristics of the population as closely as possible.

Sampling can be classified into two broad groups- *the probability and non- probability sampling*. A particularly important sampling procedure for securing representative sampling is probability sampling. Probability sampling is one in which each unit of study in the population has an equal, or at least a known, chance (probability) of being selected while a non-probability sample lacks this important quality.

Probability Sampling

In probability sampling every member of the population concerned has the same probability of being included. The simplest way of making a probability sample is to give each member of the population a number, and then pick some of the members randomly. The main advantage of probability sampling is the complete elimination of human bias in picking study units from the population. Since the sample is chosen according to probability model, the error that is likely to be committed by the inference from sample to the population, termed as **the *sampling error*** is knowable. Sampling error can be estimated and usually decreases on average as the sample size increases. The most common types of probability sampling are Simple Random Sampling, Systematic Sampling, Stratified Sampling, and Cluster sampling.

Non-Probability Sampling

Despite the accepted superiority of probability sampling methods in survey research, non-probability sampling methods are sometimes used. Non-probability sampling methods are used usually for situations in which probability sampling would be too expensive and / or when precise representativeness is not necessary. They are basically employed in qualitative studies. Major types of no probability sampling methods are:

1. **Purposive or judgmental sampling** in which elements are selected for a purpose, usually because of their unique position. Under this method the researcher selects any one which is considered as the most suitable for his purpose
2. **Quota sampling** in which elements are selected to ensure that the sample represents certain characteristics in proportion to their prevalence in the population
3. **Convenience sampling** in which elements are selected based on their availability to the researcher simply by virtue of accessibility
4. **network sampling** in which

Advantages and Limitations of the survey Method

Survey research offers several advantages. Information can be gathered about hundreds of thousands of persons with a relative ease. In order to be useful as a research tool, however, surveys must meet certain requirements. First, the sample must be representative of the larger population about which conclusions are to be drawn. Second, the way in which the items (questions) are worded can exert strong effects on the outcomes obtained. For example, suppose a survey asked, "Do you think that persons convicted of multiple murders should be executed?" Many people might agree, because the convicted criminals have murdered several victims. But, if the survey asked, "Are you in favor of the death penalty?" A smaller number of people might agree. So the way in which questions are posed can strongly affect the results

Surveys continue to be very widely used in social research for several reasons. Questionnaire responses can more easily be quantified and analyzed than material generated by most other research methods; large numbers of people can be studied, and, given sufficient funds, researchers can employ data collectors to collect the material they need.

Many researchers are critical, however, of what they see as over- reliance on the survey method. The results of surveys can often be easily quantified and analyzed statistically; but

critics argue that such quantification gives an appearance of precision to findings whose accuracy may be dubious, given the relatively shallow nature of most survey responses. There are other drawbacks too. Levels of non- response are sometimes high, especially where questionnaires are sent and returned through the mail. Little is known about those who choose not to respond to surveys, or refuse to be interviewed when the researcher turns up on the doorstep.

Advantages & Limitations in summary

1. It is rule bounded, uses sampling procedure
2. It is more reliable and objective
3. It is extensive, enables to study large population
4. It is economical or cost effective
5. The researcher does not need to do the data collection
6. The data can be easily quantified and analyzed statistically.
7. It does not allow intensive analysis
8. Its validity is questionable, the result may be artificial
9. It is not flexible, it is rigid.

3.3. Experimental Studies

In its simplest form, an *experiment* consists of making changes in a variable and, under carefully controlled conditions, observing the effects of the change on some other variable. Experiments are especially valuable for testing hypotheses that suggest a cause and effect relationship. Clear understanding of a presumed causal relationship is essential for understanding the logic and design of experiments. Therefore, we begin by reviewing these conditions.

Seeking causal relationships

Three conditions are necessary for arguing that one variable is the cause of changes in another variable. These are:

1. The variable believed to be the cause must always precede its effects;
2. The two variables must be consistently and preferably strongly associated; and
3. No other explanation provides a more satisfactory explanation of the observed changes in the dependent variable than the one put forth as its cause.

In designing an experiment, the researcher has to create conditions that meet or that come as close as possible to meeting these requirements.

An illustration will show the difficulty of meeting the conditions for establishing causality. Some persons have negative or hostile attitudes, often unfounded, about a particular group of persons. Social psychologists refer to such views as prejudice. Obviously, there are many causes of prejudice, and many conditions could increase or reduce attitudes of prejudice toward some group. Suppose we wanted to conduct an experiment to see if we

could reduce attitudes of prejudice among members of some group toward another group. Our first step would be to discover factors that are known to be related to feelings of prejudice.

Through a review of the literature we might discover that persons with high prejudice towards members of some group often had heard only negative things about that group. Using this as our theoretical basis, we could hypothesize that providing positive information about the group in question will reduce prejudice toward that group. In this hypothesis, the positive information is designated as the independent variable and prejudice would become the dependent variable.

Our next step would be to design an experiment to test this hypothesis. We would start by getting some people, called *subjects,* to agree to participate in the experiment. Let's say we got 50 subjects. We also have to create the conditions under which the subjects experience the independent variable. Here is where creativity in design comes in. Imagine that we developed an educational program consisting of two-hour sessions held once a week for three weeks. During these sessions subjects would be provided positive information about the group in question, such as descriptions of the accomplishments of members of the group, how members of the group are like one's own group, or ways members of that group and one's own group have worked together and helped one another. This information might be provided in the form of videos, talks by members of the designated group, and by participation in small group discussions.

We also have to decide how to measure prejudice. We could use a Bogardus social distance or some other scale for measuring prejudice. Whatever measure we use, we have to use it twice - once before the educational program is started and again after it is over. The first is called the *pretest* measurement and the second is referred to as the *posttest* measurement. By comparing the two levels of prejudice we could see if there was a change in the degree of prejudice among the subjects.

Imagine that the results supported our hypothesis. We found that the posttest measurement for prejudice was lower than the pretest measurement. Are we justified in concluding that the educational program caused the decline in prejudice? No, we are not! Our inability to draw that conclusion goes to the heart of experimental design.

The design we just described is referred to as a *single group* design. In this design, you collect data from a group of subjects on one or more selected variables before beginning of the experiment, apply some kind of *experimental treatment,* and collect data again on the variable or variables measured before. Single group designs do not rule out conditions other than the experimental treatment that could affect the outcome. With a single group design, one cannot meet the three requirements for establishing a cause and effect relationship. In the experiment we just described, we safely met the first requirement. We know that the experimental variable (information) preceded posttest measurement of the dependent variable (prejudice). Also, we know that there was some association between the two variables, as indicated by the decline measurement of prejudice following the educational program. But can we say that nothing else could account for the decline other than the educational program?

Alternative explanations, which have to be eliminated before one can say that the data support the hypothesis, include: History, Maturation, and Testing effect

History

History refers to any event outside the experiment that could affect the results. Suppose, for example, that during the three-week period of the experiment a rich person from the group in question gave an exceptionally large and widely announced donation to a local hospital. Possibly, knowledge of this act could have made subjects feel less prejudiced and therefore have been responsible for the decline, rather than the educational program they were in. Our experimental design is flawed in this respect and would prevent us from drawing the conclusion that the hypothesis was supported.

Maturation

Natural changes occur to persons over time. In experimental design, any natural change that could affect the experiment is known as *maturation*. So, in addition to protecting against the misleading effects of history, an experimenter has to make sure that changes in the dependent variable are not due to naturally occurring changes among the subjects. In all truthfulness, the results in our illustrative experiment would probably not be influenced by maturation. The time period would be too short for naturally occurring changes to show up. Maturation, however, can be a problem in experiments lasting months or longer.

Testing effect

Sometimes simply giving a pretest can influence the attitudes and behavior of subjects. Questions included in the pretest, for example, could cause some people to begin thinking about prejudice in ways they had not done before. As a result, when they were asked about the group in the posttest they might give less prejudiced views. Also, some might have guessed what the purpose of the educational program was and expressed views in keeping with this objective, even though their views had not changed that much. Thus, subject reactivity and not the educational program could have at least partially accounted for the decline in the posttest measure of prejudice. Consequently, the decline could have been at least partly due the pretest experience and/or subject reactivity not wholly because of the educational program. Anytime a pretest is used there is danger of creating a *testing effect*. Our experimental design also failed to protect against this threat to drawing a valid conclusion from the decline in prejudice.

The classical experiment

The classical experiment is a true experimental design which tries to eliminate the influence of any variable other than the experimental one on the dependent variable. This is done by using the design of the classical experiment in which we:

1. Create two equivalent groups at the beginning of the experiment; the *experimental group and the control group.*

2. Administer the *experimental variable* to the *experimental group,* but not to the *control group;* and
3. Measure the dependent variable in both groups before and after the application of the experimental variable. These are the pretest and the posttest measurements.

Using this logic, let's redesign the study of prejudice we presented above. Following the logic shown in **Figure 3.1**, we will use an experimental and control group. The most important consideration in the selection of subjects would be the creation of two matched groups, that is, two groups of subjects as similar to each other as possible. This might be accomplished through conscious matching of characteristics (sex, age, race, and so forth) or the researcher might assign subjects to the two groups on a random selection basis. Next, we would measure and compare prejudice levels in both groups before the experimental variable is administered. If the groups are equivalent, there should be no difference or only a small difference in the results obtained for each group. Actually, we would expect some difference in average scores between the two groups. The difference could be in favor of one group or the other because of random variations among members in each group. Any difference, however, should not be statistically significant. If a significant difference is found, the experiment should be stopped and not continued until the groups are found to be equivalent.

After equivalence between the experimental and the control groups is demonstrated, the experiment can begin. The experimental variable is administered to the subjects in the experimental group, which in our example means they would participate in the educational program. Those in the control group would continue with their ordinary daily lives. After the education program is over a second set of measurements of prejudice would be obtained from all subjects in both groups. The pretest and posttest data would then be used to test the hypothesis for the study.

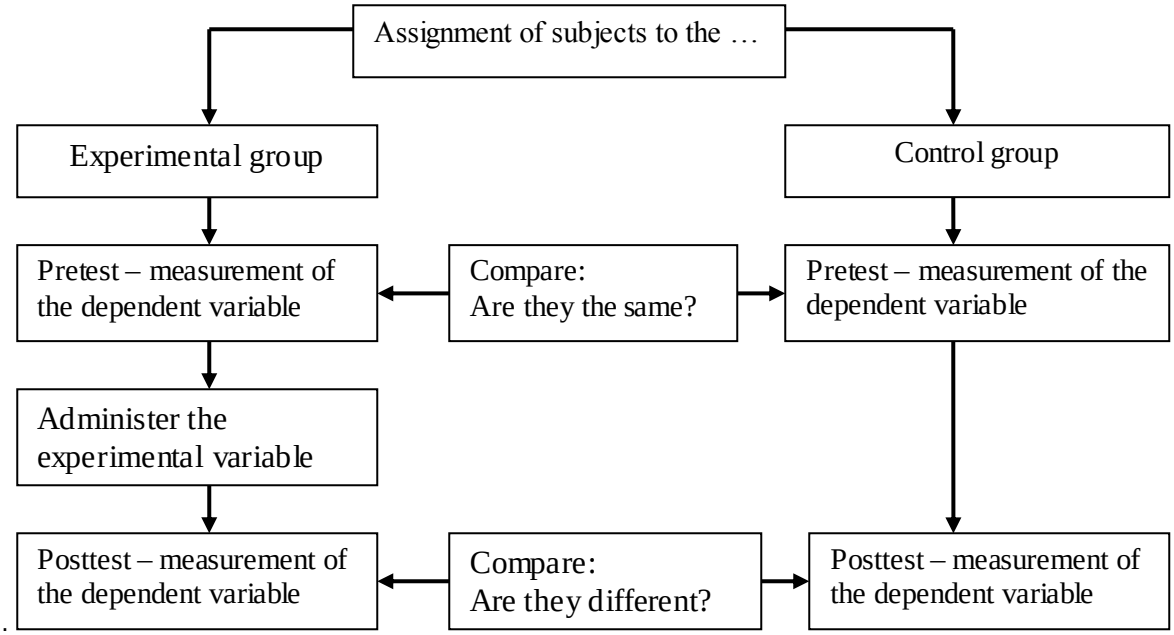


Figure 3.1. Design of the classical experiment

Testing hypotheses with a control group

Generally a hypothesis claims a larger difference between pretest and posttest results for the experimental group than for the control group. The basis for this reasoning is that:

1. The two groups were alike with respect to some dependent variable at the beginning of the experiment.
2. Subjects in both groups were exposed to the same kinds and amounts of extraneous or outside influences during the course of the experiment.
3. Subjects in the experimental group, however, were exposed to an additional and deliberately applied influence, the education program, which was designed to cause a reduction in prejudice.
4. The experimental group, therefore, would be expected to show a greater decline in prejudice.

Use of the control group allows us to detect the effects of the experimental variable on levels of prejudice. If the posttest measure shows about the same reduction both in the experimental and control groups, then the change must be due to some external factor. But, if prejudice levels decline substantially only in the experimental group, it is reasonable to conclude that the decline was caused by the treatment we administered. Even if prejudice scores in both groups declined, but more so in the experimental group, we could take this as evidence of the effect of the educational program. In more precise terms, the difference in the pretest and posttest measurements for the experimental versus the control group is known as the *experimental effect*. This comparison, however, assumes that the subjects in two groups were equivalent at the beginning of the experiment. And this depends on how the subjects were assigned to each group.

Settings for classical experiments

Generally, classical experiments are carried out in controlled as opposed to natural settings. A controlled setting is any location created specifically for the purpose of the experiment. It may be as simple as an ordinary classroom or office taken over temporarily for introducing the experimental variable. Or, the setting could be a complex laboratory with special equipment and means for observing and recording the behavior of subjects. Regardless of the arrangements used, experiments are notable for the degree of control the experimenter has over all the features of the experiment. Subjects are randomly assigned to the experimental or control group. In addition, the experimental variable is applied under conditions that are created and controlled by the experimenter

Quasi-experimental designs

Quasi-experimental designs are based on some, but not all, of the characteristics of the classical experimental design. Some quasi-experimental designs are based on randomization, but lack a pretest measurement; others may be based on observations for only one group. All involve at least a posttest measurement. Also, in most quasi-experimental designs the investigator has relatively little control over the independent variable. Instead, the investigator

creatively seeks situations where at least some of the principles of experimental design can be applied.

The distinguishing feature of most quasi-experiments is that they are carried out in the natural conditions of everyday life. Examples include the study of the effects of family planning programs, effects of supplemental food on the intellectual development of young children, and whether agricultural practices change as a result of educational programs. Three more frequently used quasi- experimental designs are described next.

One group, pretest and posttest design

This design is based on one group, a pretest measurement of a variable, the application of an experimental variable, and a posttest measure of the variable measured in the pretest. The example involving reduction of prejudice, used at the beginning of this chapter, was based on a one group design. Because no control group was used, we cannot say with certainty that any observed decline in levels of prejudice in the group studies was due to the program they experienced.

Sometimes, however, the one group design is the only one that can be used. Let's say we wanted to see if a workshop could make managers more sensitive to the needs of employees they supervise. We could develop two measures of an employee sensitivity scale, administer one at the beginning of the workshop, conduct the workshop, which would be our experimental variable, and then a week or so later, have the participants respond to the equivalent sensitivity scale.

With this design, at least we would have before and after data. The short time period involved would reduce, if not eliminate any threats associated with history and maturation. Delaying the posttest for about a week will help reduce reactivity and testing effect, although other threats would remain. These limitations would have to be acknowledged in a report describing this study.

One-Group Posttest-Only Design

As its name states, a posttest-only research design involves conducting a one-time measurement, such as a survey, after the intervention has been conducted. Since it does not involve pretest (baseline measurement), it is not possible to identify changes occurred after the intervention. Also, since this design does not involve comparing one group with another group, it cannot be used to determine if a group exposed to one intervention had better outcomes than a second group exposed to a different intervention or no intervention.

Conducting a posttest-only design can provide information about a group of people or a community at one point in time: in this case, after a certain program was conducted. Thus, it cannot be used to determine if the program was effective. However, this snapshot can provide valuable information if compared against standardized information, such as national surveys or community-level demographics.

Two- group, posttest- only design

A slightly more rigorous research design than a (one-group) posttest-only design is to conduct measurements, such as a survey, to two groups after an intervention. In this situation, measurements are taken from two groups after an intervention occurred, but measurements are not taken prior to the intervention (at baseline). Without baseline evaluations, it is not possible to measure change over for either of the two groups. In other words, without baseline evaluations, it is not possible to document whether the intervention improved the condition of either group over time. However, since there are two groups, a posttest-only with comparison group design can provide a moderate basis for suggesting the effectiveness of a program.

For example, one group may consist of community members who were exposed to intervention, and a second group may consist of community members who were not exposed to the intervention. Conducting measurements after the intervention can provide an indication (but not proof) that the intervention was effective. For instance, this design may demonstrate that individuals who were exposed to the intervention had better scores (such as on knowledge or intentions) than individuals not exposed to the intervention. When true, this suggests that the intervention was effective, but does not prove that it was effective because there are many other factors that might explain the results. Similarly, one group may consist of community members who were exposed to one form of the prevention intervention, and a second group may have been exposed to a different version of the intervention. Again, one group may have higher scores than another group, suggesting that one version of the intervention was more effective than the other. But again, because this research design has several weaknesses, many factors may explain the results, and it cannot demonstrate that one version was indeed more effective.

Further variations in experimental design

So far we have discussed experiments in which an experimental variable is applied in the same way to all subjects in one experimental group. These represent "all or none" applications of the experimental variable. There are other ways to administer the experimental variable. For example, instead of the all or none application, different levels or amounts of the experimental variable can be applied to two or more experimental groups.

As a way of illustration let's return to the example of reducing prejudice. Instead of using only one experimental treatment and group, we could test the effects of three different ways of reducing prejudice. In this case, we would create three experimental groups, while still retaining one control group. Subjects would be randomly assigned to one of the three experimental or to the single control group. The three treatments could consist of the following:

1. Experimental group 1 in which subjects see a specially prepared film, are given material to read, and participate in discussion groups.
2. Experimental group 2 in which subjects are given the same material to read as given to members of group 1 and participate in discussion groups, just the same as those in group one, but do not see the film.
3. Experimental group 3 in which subjects receive only the reading material.

In addition, we would create a randomly selected control group of about the size as each of the experimental groups. Pretest data would be obtained from subjects in all four groups. The experiment would then be conducted and posttest measurements of prejudice would be obtained from subjects in the three experimental groups and in the control group. With these data we could determine:

1. Whether each of the treatments was effective; that is, were prejudice measurements significantly lower among subjects in each experimental group as compared with those in the control group.
2. If the most extensive treatment, represented by group 1, was more effective than the less extensive treatments, as represented by groups 2 and 3.
3. If the combination of treatments, as applied to group 2 was more effective than just the single treatment, as applied to group 3.

The additional data obtained from groups with multiple treatments are frequently useful in making decisions involving development of programs. For example, suppose we found that the treatment with the movies was not more effective in reducing prejudice than the combination of reading material and participating in discussion groups. This information could help in developing programs to reduce prejudice by showing that use of films, which are more expensive to create and use, do not need to be used.

Strengths and limitations of experimental research

Strengths

A properly designed and executed experiment is the most effective way of testing for the effects of one variable upon another. Two powerful strengths of this method of research are:

1. Conditions other than the experimental variable that could affect the dependent variable are minimized, if not eliminated completely; and
2. The experimental variable can be manipulated or controlled by the experimenter.

Together, these conditions allow rigorous testing of *causal hypotheses*. These are hypotheses stating a cause and effect relationship. Experimental research also has other positive features. Many laboratory experiments are brief, inexpensive, require little special equipment, and can be easily carried out by one person. Laboratory-based experiments also can be easily replicated, which allows for the accumulation of knowledge. Experiments can also be used to test the practical value of a new program, such as teaching techniques of family planning or for improving knowledge of nutrition.

Limitations

One of the main limitations of the experimental method is the difficulty of meeting the requirements for both internal and external validity. Carefully controlled experiments, which are often high in terms of internal validity, frequently have low external validity, while quasi- experiments conducted in natural settings can be high on external validity, but often

lack internal validity. In addition, experiments generally are not designed to provide empirical generalizations to a larger population. Experimental and control groups generally are not randomly selected from a population: Hence, anything learned about these subjects cannot be used to describe parameters for any population. The small size of experimental and control groups also limits generalizing from the experimental results. Finally, experiments in natural settings can be time consuming, require considerable coordination, and can be costly

3.4. Documentary Research

The previous sections described how to conduct an experiment and how to prepare for and conduct a survey. Both methods depend on interaction with people. In this chapter we show how research can be done simply by using data that is already available. Many kinds of *available data* exist in every country including:

- Social statistics published by government ministries,
- Data collected in previous surveys and other studies; and
- Information that can be extracted from newspaper or magazine articles, books, television shows, folk tales, and other sources.

Documentary research (also known as secondary research), which is the systematic use of printed or written materials for investigation, is often regarded as an also-ran. Yet there are very few pieces of research which do not involve some scrutiny of documentary material. Some form of *available data* is used as background information in nearly every study. In addition, many studies are based solely on further analysis of data collected and made available by various organizations. Thus, almost any study you do will involve the use of available data. Documentary research, in one guise or another, is in fact one of the most widely used of all methods of gathering socio-economic data.

Some of the documents most often consulted in social research are public and private records, usually termed archival sources. The data produced by governments are extremely extensive, and include several major types of resource material. Population censuses, for example, are taken at regular intervals, and provide data on many social and economic issues. Since response is obligatory, the material available from censuses is unusually comprehensive. Governments also carry out other surveys to provide more continuous information than that generated by the periodic censuses.

The documents used in research virtually always also include information and findings produced by previous writers in the field in question. Many investigations are as much concerned with collecting and analyzing materials from the work of others as with generating wholly new data.

When using available data, one needs to check the level at which the raw data are aggregated. Mostly, data are combined or aggregated in some way and reported at aggregate levels. Sometimes the data are aggregated for comparisons between rural and urban areas of a

country; sometimes by provinces within the country; and finally for the country as whole. Before deciding to use certain data, you have to be sure that the data are reported at the level of aggregation you want to use. If you wanted to compare school attendance rates for certain towns, and if the data was aggregated at the province level the study could not be done. If data are reported at a lower level of aggregation, say at administrative levels that make up towns, you could combine the data for each town and continue with your analysis.

Caution in interpreting results

The level at which data are aggregated also has to be taken into account when results are interpreted. An example will show why this is important. Suppose we obtain the number of votes cast in each of 200 voting districts for the candidates representing the socialist and conservative parties in a country. We could then calculate the percentage of voters who voted for each candidate in each of the 200 districts. Further, let's say we obtained data on the per capita income for these same districts. Suppose also that we were testing the hypothesis that voting for conservative candidates was positively related to per capita income: That is, the percentage voting for conservative candidates increased as per capita income of the districts increased. Imagine also that the hypothesis was supported: As per capita income of districts increased so did the percentage of votes cast for the conservative candidates. That is alright, we could conclude that the hypothesis was supported at the level of the voting district.

But suppose we wanted to make a generalization at the level of the individuals, who, after all were the ones who cast the votes. Now we have a problem: We have no data at the individual level. The data were aggregated at the level of the voting district. Each district might contain thousands of individuals. And we know nothing about these individuals. We do not know who voted; and if they voted, whether they voted for the conservative or socialist candidate or what their income level is. Yet we want to generalize about individual behavior.

In situations like this, you might be tempted to infer that what was found at the aggregated level is also true at the individual level. But there is a danger; you could be in danger of committing *ecological fallacy:* That is, assuming without sufficient evidence that what is true at an aggregated level is also true at the individual level. Though probably unlikely, there remains a possibility that a large proportion of low income persons voted for the conservative candidate or that large proportion of the high income persons voted for the socialist candidate. With the data in hand, we could not exclude these possibilities. When aggregated data are used, one has to be careful in making generalizations at levels below that used in the analysis.

Strengths and limitations of documentary sources

Strengths

Analyzing available data is a quick, low cost way of doing research. The often costly and certainly time-consuming process of data collection is eliminated. Secondary analysis also offers opportunity to analyze data based on enumeration or very large samples. Another advantage is that you can study issues that may be too politically sensitive to study in person. In addition, most analyses of available data can be carried out by a single investigator.

Limitations

Documentary sources vary widely in terms of their accuracy, and a researcher making use of them has to evaluate their authenticity. Newspaper reports, for example, are notoriously casual in their standards of accuracy, particularly the more popular papers and magazines. The data may not be free of errors or other bias introduced at the time of data collection or during earlier analysis of the data. When using available data, it is a good idea to read the "Methods" or "Data Collection" section of a report to see what safeguards were taken to minimize errors or bias in data collection and analysis.

Officially published statistics are, of course, more reliable than newspaper reports. However, even such statistic must always be interpreted by the researcher, who has to be aware of the many limitations they can have. For example, all countries keep official statistics of rates of different types of crime, but these reveal rather little about the real distribution of criminal behavior, because the crimes registered are only those reported to the police. In the case of crimes like theft, official statistics include only a small proportion of offenses which actually occur; many simply never come to the notice of police.

Sometimes, despite the great advantages of this method, the data available simply cannot be used as indicators of the variables you want to investigate. As the investigator, you have to defend the use of any available data in terms of its validity for the variables you are using the data to measure. If you have doubts about the quality of the data, you should carefully consider whether to re-analyze the data.

3.5. Participant Observation - Field Research

Observation is a flexible way of collecting data. It can be conducted in different kinds of social settings; involve different forms of relationships with the persons being observed. Observational studies differ in terms of the role the observer takes in relation to the persons or groups being observed. At one extreme, the observer can simply observe without having any interaction with the *subjects* being observed. This is non participant observation. In non-participant observation the observer simply watches and listens to what is occurring in a situation. Observations are recorded in words as a narrative description of what was observed. The observer tries to describe the most important features of the behavior as fully as possible.

At the other extreme participant observation in which the observer can join the group being studied and participate in all its activities while, at the same time, observing the activities of the members of the group. *Participant observation* allows the observer to experience and learn about a group from the inside, by participating and observing the daily life of members of the group. The observer can play different roles with varying degrees of participation.

As the name implies, *participant observation* is based on observation of people while participating with them in their normal, daily activities. These kinds of studies are almost always done in natural settings as in homes, public areas, schools, offices, factories and many other places where everyday activities occur, but not in *controlled settings* that are specifically created for the purposes of research. The observer arranges to become a member

or a guest of the group and then over a period of time, observes and records what members do and what they talk about.

Involvement with the group can range from becoming a full member and actively participating in all things the members do to less active roles. How active the observer has to be decided in advance of observation. Most observers assume less than a full membership role. For one thing, no observer can really enter into all the activities of most groups, particularly a village or community life. In these settings, culturally defined roles for persons by gender, age, marital status, social status, and other community-defined conditions limit the extent to which an investigator can participate and observe activities of certain members of the group. A male observer, for example, could not participate in many of the activities of women, while a female observer might have difficulty observing decision-making sessions of the male elders of a village.

Regardless of the level of participation, the same data collection and analysis techniques are used, mainly unstructured observation, based on repeated interaction with participants, and unstructured interviewing. In addition, investigators make full use of any available data, such as historical records or census reports, and may even conduct surveys. Using all possible data, the investigator assembles information for answering his or her research question.

Periods of observation may be as brief as several weeks or extend to a year or longer. Studies of organizations and formal groups, are generally on the shorter side, whereas studies of villages or other communities frequently last longer. Regardless of the length of time involved, most participant observation studies share certain common features.

Conducting a participant observation

Most participant observation investigations go through three phases:

- Preparing for fieldwork
- Conducting the observation, called the *field work* phase
- Analysis and interpreting the findings and preparing a report.

Preparing for field work

This includes all the activities an investigator has to do before beginning observation. These normally include:

- Specifying the topic or problem to be investigated;
- Conducting a review of the literature;
- Deciding on the degree of participation in the group to be studied; and
- Preparing for living in the field during the period of observation.

Specifying the research question. We emphasized previously that stating the research question as clearly and precisely as possible is the first step in any research project. This

requirement is less important when designing a qualitative investigation such as participant observation because qualitative methods allow greater flexibility.

Reviewing the literature Is an important aspect of any research undertaking as you might know well already. In addition to the points discussed in chapter two, reviewing literature enables you to become familiar with the group you intend to study. You will need to seek all available information you can find about the group. This certainly will include any written sources, such as histories, research reports, census data, or results from previous surveys.

Deciding a relationship with the group. Deciding on a relationship really involves two decisions. One decision concerns the degree of involvement; the other is whether the investigator makes his or her presence known to the groups being observed. As shown in **Table 4.1,** at least four arrangements are possible.

An investigator can assume one of several relationships with group members. He or she can become a full member of the group and participate in all activities, but with his or her role concealed from members of the group, as represented in the upper left cell of **Table 4.1**. As a way of illustration, a student could work in an office or factory or join some informal group and observe and record descriptions of activities and conversations without revealing his or her true purpose. This eliminates the threat of reactivity, i.e., persons behaving differently than normal when they know they are being observed. Hiding one's true intent, however, raises serious ethical questions because the purpose of the observer is not known to the subjects and they have not provided their informed consent to be observed. When the concealed approach is considered, the investigator has to ask himself whether the study is important enough to warrant invasion of the subjects' privacy. If you are doing such a study as part of research required by your university, an ethical panel at your university should also review your proposal.

The full participant observer role is most often and properly used with the full knowledge and consent of all the members of a group. This approach is shown in the lower left cell of **Table 3.1.** While ethically responsible, this role also increases the reactivity effect. Knowing they are under observation and what they do and say is being noted by a stranger in their group, persons often act differently, showing them selves in the best possible way. If the observer is skilled and good at establishing warm, trusting relationships, most members of the group will accept the observer's presence, and, after awhile, generally behave in a normal fashion. Under these circumstances, the threat of reactivity usually is greatly reduced.

Table 3.1. Possible relationships with the group being observed

Awareness of observer's role by the group	Degree of observer's participation in the group	
Not Known	**Substantial**	**Partial**
	Substantial to full participant, role concealed	Casual to limited participant, role concealed
Fully known	Substantial to full participant, role openly known	Casual to limited role, role openly known

Participation may be less than full involvement as illustrated by the right-hand column in **Table 3.1.** In most extended participant observation studies, disguising one's role would be difficult as well as unethical. In addition, one could assume a substantial role in a group without making one's purpose known, as illustrated on the upper left side of **Table 3.1**

Preparing for living in the field. The period of observation is referred to as the field work phase of an observational study. Preparing for the field includes arranging for access to the group, providing for daily living while observing, and obtaining the supplies needed for recording and analyzing observations. Access can be arranged in various ways. In organizational studies, access is generally achieved through approval by the proper level of management. For village or community studies, access almost always requires the permission and sponsorship of the local leaders or political officials. Getting local approval may first require obtaining approval from regional or national officials. If they approve, they can often act as the sponsor of the investigator and guarantee approval from local officials.

Planning for fieldwork may also include making arrangements for "bed and board." Living arrangements are particularly important for studies extending over many months. Who the investigator lives with can be crucial to the success of an investigation. Selecting a "host" family whose members are well known and highly respected by members of the group will help achieve rapport and greatly aid in conducting field research. The head of the family and family members can also open access to others in the group, supply an inside view of the group, allow you to get a trusted view of your emerging perceptions, and provide a validity check on your conclusions.

Before starting fieldwork, you will also want to have sufficient notebooks for recording observations. If members of the group approve and are comfortable with audio or video recording, you will need to get this equipment and plenty of spare batteries, tapes, or disks.

The objective of the planning phase is to prepare for observation in the selected setting. In contrast to the design for a quantitative study, any plan for observing should be considered as flexible, subject to change as the field work progresses. With an initial plan, one is ready to begin observation.

Observing

The main activities carried out in conducting observation include:

- Entering the group and gaining acceptance by its members;
- Establishing one's role in the group;
- Observing and recording observations;
- Analyzing observations; and
- Leaving the group.

Gaining acceptance. There is no formula for gaining entry and establishing one's role as an observer in a group. The investigator's initial task is to establish rapport, a feeling of mutual trust and confidence, with leaders and potential key informants and other members of the group. *Key informants* are persons who are able to supply unusually valuable information relevant to the investigation. They may be formal or informal leaders in the group; government officials; long time friends of the investigator from the group; or persons who the investigator meets and establishes a close bond with. Knowledge of the group gained during the planning phase can help in identifying potential key informants. They also become the links to other members of the group. Often members of the host family are important key informants.

To achieve rapport, a good rule is to assume the role of a respectful guest, showing respect for each member of the group and establishing rapport with them. A careful observer moves slowly in establishing relationships and in gaining the respect and confidence of critical leaders and key informants, and then, through their sponsorship, extends his or her relationship to all members of the group.

Building rapport is a process, similar to developing feelings of trust with friends. If you are good at this process and can quickly establish warm, close bonds with others on the basis of mutual respect and trust, you will probably be good at creating and maintaining rapport. But if you have difficulties in this area, you should think carefully about using the participant observation method.

Establishing one's role. In establishing a role, observers have to be flexible and be ready to adjust quickly to changing perceptions of the observer's presence. Members may encourage fuller participation by the observer in various activities or they may remain suspicious of the observer and limit his or her role. Encouragement for a greater role is a positive sign and, obviously should be accepted with appreciation. Observers also need to react tactfully and accept any limitations with good manners.

Observing and recording field notes. In participant observation, observing occurs mainly by watching, listening, and asking questions. Generally this process goes on over a period of time, with opportunities to observe and talk with members of the group a number of times and under a variety of circumstances. Such prolonged interaction provides opportunities to get "deeper" insights and to learn about the motivations of group members. Observing, however, takes considerable skill and attention. The objective is to create a full, accurate description of

what occurred. Also, asking questions has to be done carefully, based on the readiness of respondents to answer questions

Observing activities and recording descriptions of them occur together. Each period of observation is called a *session*. A *record* is prepared to describe what occurred during each session. Records are prepared in written form and constitute the *field notes* of the study. The field notes contain the data that is analyzed to produce the findings of the study. For recording observations, you have four choices:

- Use of an audio recorder or recording interviews
- Use of a video camera for recording action and conversation
- Relying on recording notes by pen or pencil in a notebook
- Relying on your memory

Each recording method has strengths and limitations. The obvious appeal of audio recording is that it produces a full record of any conversation. Both audio and video recording, however, have several severe limitations. With audio recording, you get only what people say: There is no record of how they acted; no body language. Video recording captures action as well as verbal content, but it is even more reactive than audio recording. Using a video camera is a sure way to alert persons that their actions and conversation are being recorded. Few persons can resist the urge to "act" a bit, making their behavior different from what it normally would be in the situation being observed.

Either method is impractical for recording activities throughout a day and evening. Also, the apparent advantage of getting so much information on audio tape, however, is a distinct disadvantage during data analysis. Every hour of data recording requires about six hours for transcribing the content to a written record, and that assumes speedy typing. An investigator using extensive audio or video recording can quickly find him or her self overwhelmed with records and be faced with sifting through mountains of data to find significant information.

While being the least reactive, relying entirely on memory has its own limitations. With so much going on during any period, most of us are unable to remember all the rich detail so important to qualitative data collection. Worse, it is easy to confuse the names of persons who were present, who said what to whom, and who took what kind of action.

This leaves the old fashioned way of taking notes by writing them down in notebooks. Note taking, however, can also intrude upon observing and create some unease among persons being observed. To minimize any problems, investigators frequently limit note taking during a session to writing down just a few key words or phrases. These *field jottings* are used to help the observer recall the main features of the observational session. Even jotting down brief phrases occasionally can upset some persons. To the extent possible, therefore, try to find inconspicuous times and places for creating field jottings. You can train yourself to make mental notes of key interactions and conversions and then find a time as soon as possible thereafter to jot down notes.

Field jottings are only aids for creating the full record of what was observed. To protect against memory loss or distortion, jottings or mental notes should be converted to full field notes immediately a session, if possible. Natural breaks in actions, such as rest periods, can provide an opportunity to jot down mental notes. When opportunities do not occur naturally, you will have to rely on your mental notes until you have an opportunity to complete a set of notes. If not done earlier, field jottings should be expanded to full notes by the end of each day. Your field notes are your data for the investigation. These notes contain descriptions and your interpretations of all that you observed. They should be as detailed as you can make them, with exact quotes of key conversations and from interviews. Writing field notes may take as much time as you spend in observing. Field researchers learn to reserve time for preparing their field notes. In preparing field notes, investigators also include analytical comments. As the investigation progresses, analytical notes tend to increase.

Data Analysis and interpretation

In quantitative studies, such as experiments or surveys, data analysis follows the collection of data. Qualitative research is different: In qualitative investigations, data collection and analysis proceed together, with each influencing the other. There are no precise guidelines for analyzing qualitative data. The investigator interacts with his or her data, constantly looking for patterns in the observed interactions and associations among forms of observed behavior.

Analysis is based on frequent review of accumulating field notes to identify patterns and relationships. The heart of qualitative analysis is the interaction of the observer with his or her data. Analysis of qualitative data is partly an art. Each individual brings a unique combination of skills, knowledge, and a way of thinking to this process. Consequently, there are few specific, fixed rules to guide qualitative analysis. Nevertheless, we suggest several ways to analyze qualitative data. Not all suggestions will apply to the analysis of a body of data, but some of these should help in most situations.

First and foremost, triangulate to the extent possible. Constantly review your data: Look for consistencies and inconsistencies in what you have heard, seen, or read about. When consistencies occur, look for variables that tend to occur together. This will give you an idea of possible relationships among variables. When differences occur, find out why informants disagreed. Whenever you can, get additional data on matters in dispute. For example, if informants disagree on the numbers of persons moving from an area, try to get the actual number from official records. Then, investigate why you got different reports from persons. The answer may give you insight into how different informants perceive local conditions, depending upon their position in the local social structure or how much they feel threatened by social changes.

Watch for negative evidence. Be alert to conditions that differ from what you expect. Further analysis of negative evidence often leads to important new insights, revised hypotheses, and the search for additional critical data. When you discover something that does not fit your present understanding of a situation try to find out why. For example, suppose you found that young persons in a rural area preferred to remain farm workers rather than migrate and seek work in cities. Now, you would have to make a decision: Did this finding occur

because of (1) errors you made in observation; (2) is it a true, systematic variation from the general pattern; (3) did you find some unusual cases that are exceptions to the general pattern of young persons leaving the area; or (4) is the finding an indication of a new social trend. Any result contrary to what you expected should be examined carefully. Any of the four explanations might be correct. Use of triangulation may help establish which interpretation is valid.

Develop categories for organizing and analyzing observations. Try to identify socially meaningful categories for analysis purposes. Categories may be based on locally-used descriptions (tribal or lineage names, references to "good" versus "no good" people, etc.) or may reflect social science concepts (integrated versus alienated members of the community, social status positions, etc.). The meaning of locally used terms is important for understanding the behavior of group members toward one another. Initially you may want to use both local systems of classification and categories based on social science concepts in developing your files. As you gain experience, you can then merge the two systems and have one set of files for final analysis.

Look for deviations from the norms. Try to identify people or groups whose behavior does not conform to the prevailing norms. In sociological terms these persons or groups are called deviants. Identification of deviants and names for them may come from the deviants themselves, from other members of the group, or you may construct definitions for them based on social science usage. When you identify deviants try to understand why they are different and how their differences affect the behavior of the group. Are the deviants ahead of the main body of the group in setting new norms; are they a residual group left behind as the main group adapted to new conditions; or do they represent a collection of unconventional individuals whose behavior has no major social significance?

Watch for sequences of events and interactions. Are there patterns of association among norms, deviants, events, or other concepts in your field notes and files? Which of these stand out as most prominent or important? Why do they occur? Use connections you see to develop hypotheses based on your understanding of relationships between concepts. Test these hypotheses with further observations and modify any emerging conclusions you might have tentatively drawn.

Use any available data in your analyses. Investigators using participant observation also seek and use all available data they can find. These data may include census, population, crop or other economic data, and historical information.

Guard against premature or biased conclusions. Qualitative analysis is tricky: Frequently there is no objective, outside criteria to use in analyzing data. Consequently, it is sometimes easy to think you have spotted a pattern in your data. Sometimes this pattern is not in the data, but in your perception of the data. You will need to guard against hasty or poorly based conclusions. The best protection is to examine all the data and to look for data both for and against any hypothesis or conclusion you wish to present then base your conclusion on your best judgment.

Ending fieldwork and leaving the group

In most quantitative investigations, such as surveys, the investigator knows when to stop. Data collection ends when the last member of the sample is interviewed. In field research, there is no specified time for ending data collection. Each researcher has to decide when he or she has enough data in the form of a narrative description of the behavior of the group being investigated. There is no precise basis for making this decision.

After you decide you have all the data you need, you are ready to leave the group. Decide in advance how to leave the field. One way is to make a quick exit, with little advance warning. This way may be the appropriate way to exit when the observer's role was unknown to the group. When one's role is known, a better way is to make a gradual, slow withdrawal over a period of time. When extremely close relationships are established, leave-taking is similar to saying goodbye to close friends: We inform them in advance and pay visits before the final departure. Return visits provide an opportunity to verify information, clarify discrepancies that become obvious in later analysis of field notes and to get feedback on conclusions from key informants and others who provided critical data.

Either way of exiting should be based on good manners, including showing appreciation to your hosts as any sensitive guest would. As a minimum you will want to express public as well as private appreciation to any sponsors, leaders, officials, and key informants as well as to families and persons you observed. In making an exit you also have two ethical responsibilities. One is to maintain any protection you promised to the subjects. The other is to your research colleagues and this is to leave in such a way that opportunities for further research are enhanced.

Generalizing from a qualitative study

Generalizing conclusions from a field study is also different from that for a quantitative study. In the latter approach, the sample is designed to allow for empirical generalization of results to the population from which the sample was drawn. Most observational and other qualitative studies are conducted within one or, at most, several sites. These sites cannot be considered as representative of any larger population of similar sites. Even if it could be argued that they are, the sample of one or several sites would be too small to support any empirical generalizing. How then can an investigator hope to extend conclusions to contexts other than the one studied?

One answer to this question is that precise scientific generalization may not be the objective of the investigation. Instead, a field investigation may be conducted for its practical, applied value. If the purpose of a field study in a community were to help the government authorities develop plans to assist the community to stemming the spread of AIDS, for example, practical recommendations based on evidence-based recommendations would substitute for scientific conclusions and generalizations

However, scientific generalizations can also be derived from qualitative data. Doing so, however, requires considerable skill in conceptual analysis. The investigator seeks to identify

critical concepts and to establish relationships among them. Using these empirically established relationships, the investigator builds a conceptual or theoretical explanation for behavior that was observed. The resulting explanation is then tested against existing theory as a final way of checking its validity. This approach goes by the name of *grounded theory* because any theoretical explanation that is developed is based on or grounded in the descriptive data collected by the observer. For more information on this approach to generalizing the results of qualitative data, we suggest you consult one of the many books devoted to qualitative research.

The Advantages and Limitations of Field Research

Observation is superior to other methods of data collection for describing actual behavior in a given situation. Available data describes only certain features of past situations while surveys provide only what respondents say is true about something. These verbal responses may or may not match with what the respondents actually do in real life. Observation provides descriptions of what actually happens in real life situations.

Observational methods also yield richer and more complex data than other forms of data collection. Observation is unequaled for describing the complexity of behavior, including the kinds and intensity of the actions of people, the emotions that are involved, what is said, and how different members of the group influence each other.

Another advantage is that observation is a flexible way of collecting data. As new insights are gained or new leads open up, the observer can shift perspective quickly and explore new areas of inquiry. This is not possible with most surveys: Once questions are set, all are asked in the same way for all respondents. With available data, the investigator has no choice; he or she has to use whatever data is at hand.

Lastly, observation studies can be carried out with less community attention or disturbance than surveys. This can be a powerful advantage when local officials or leaders have to grant permission for a study. Gaining approval for a study based on one researcher living in a community, for example, is easier than getting approval for a survey that will require interviews with a large number of persons.

Field research offers the advantage of probing social life in its natural habitat. Although some things can be studied adequately through questionnaires, others cannot. And direct observation in the field lets you observe subtle communications and other events that might not be anticipated or measured otherwise.

Field research–where it is successful- provides much richer information about social life than most other research methods. Once we understand how things look from the inside of a given group, we are likely to have a much better understanding than before. Fieldwork is virtually the only method available when the researcher is studying a group whose culture is largely unknown to outsiders, and has to be learned before their activities become fully comprehensible. For this reason, it is the main research method used in anthropology, which

is concerned to document and understand "other cultures". Fieldwork gives the investigator more flexibility than other methods.

Limitations

A major limitation of the observational method is the considerable amount of training, experience, and skill required to observe and record events accurately and completely. Not all persons can acquire the needed skills. In addition, observation generally is limited to descriptions of what happens in small groups of people, which also limits the ability to generalize the results.

Observation can also be very demanding. Frequently, conversation and action occur at the same time. The observer has to note what is said, to whom, in what way, with what effect, and what kind of behavior was occurring. All of these things can occur very quickly as part of complex interaction among a number of persons. Inexperienced observers can miss part of the interaction or fail to record the action accurately. The substantial demands placed on observers also raise the possibility of bias in how observations are made, recorded, analyzed, and interpreted. In observational studies, the investigator is the research instrument. He or she observes, records the observations, and then analyzes and interprets them. This is why the accuracy and completeness of the record of observation is so important. Other social scientists will examine and decide by themselves whether the conclusions in a report are warranted, based on the record supplied by the author.

It is very difficult to develop specific guidelines to do participant observation. The researcher must rank priorities and decide the kinds of data that are most important. There is no guarantee that different researchers dealing with the same issue will report the same conclusions. Therefore, the method is less ***reliable.***

We can study only small number of people or communities using this method, as data are collected by the researcher himself. The data generated by participant observation are less generalizable as the method of selecting cases does not fulfill the criterion of representativeness.

It is time taking and the quality of results depends to a large extent on the interpersonal skills and experiences of the researcher. It also entails ethical problems when it is done covertly.

3.6. Focus-Group Discussion

Focus groups are a special kind of group interview combined with techniques of qualitative analysis. Most focus groups consist of five to ten persons who are selected to discuss a specific topic or issue. Criteria for selecting participants depend on the purpose of the investigation. When a focus group is used as part of an exploratory study, as in preparation for constructing a questionnaire, the investigator would select persons matching the characteristic of those who will be interviewed later. When the purpose is to learn how opinions may be changing on some issue, participants might be selected purposively to represent a range of views of the issue.

Once selected, the investigator brings the participants together for one or more sessions and initiates a discussion. The investigator decides in advance what he or she wants the group to talk about and prepares a set of questions to get the group discussion started. Although questions are prepared in advance, they are presented informally to the group. The order in which questions are presented to the group depends on how the discussion develops. As the conversation develops, new questions may occur to the investigator and be presented to the group for discussion. The investigator or an experienced moderator asks the questions and keeps the discussion focused on the issue being investigated. As views are expressed, the moderator seeks clarification, asks for agreement or disagreement on opinions that are expressed, and probes for additional comments.

The moderator establishes and sustains rapport with the group, maintains a neutral role in asking questions, encourages all participants to speak without letting any one person dominate the discussion, and keeps the discussion focused on the issue. Managing a focus group requires a great deal of skill and tact. The investigator may serve as the moderator or may select a person who is skilled in group processes to moderate the focus group.

Focus group sessions generally last one hour or at the most two hours. Recording the discussion may be done by an assistant, who maintains a set of notes on what is said, or by audio or video recording. Taking notes by hand is a difficult task. Discussions can become heated, with several persons talking at once. Important points can easily be missed or incorrectly recorded. For these reasons, focus group discussions are usually recorded on audio tape. Audio is recommended over video recording because it is easier, less expensive, and less noticeable to participants, and, therefore, less reactive. Participants in focus groups generally ignore the microphone used for audio recording, but are much more aware of the camera and lighting that may be necessary for video recording. In addition, audio recordings are also easier to transcribe for later analysis. In addition, an observer can add to the audio record by recording notes on the kinds and levels of emotion and facial and body expressions of agreement and disagreement that were expressed at various times by participants. These additional observations can add meaning to the verbal content of an audio recording.

This method- or any of its modified forms- is extremely useful particularly in rural studies in which homogenous communities are encountered as a rule. Here, also, the focus- groups are, more often than not, made up of individuals that are well acquainted to each other. Hence, since the participants share in common a wide range of knowledge and are related to one another in more ways than one, an in – built mechanism of control exists concerning the information which they provide. As a result information obtained through the focus- group method can have a wider margin of validity, and can be extremely useful particularly when it is used together with material obtained through other methods of research.

3.7 Life Histories.

Life histories consist of biographical material assembled about particular individuals – usually as recounted by themselves. No other method of research can give us as much detail information about the development of people's beliefs and attitudes over time. Life histories are particularly valuable when research is concerned with connections between psychological

development and social processes. Such studies rarely rely wholly on the memories of the people involved, however. Normally documentary sources- such as letters, contemporary reports or newspaper descriptions -are used to expand upon and check the validity of information provided. Views differ about the value of life history material. Some feel the method is too unreliable to provide useful information; but others believe that life histories offer sources of insight that few other social research methods can match.

Life history contains a description of important events and experiences in a person's life in his /her own words. In constructing life histories, analysis is a process of editing and putting the story together in such a way that it captures the person's own feelings, views, and perspectives. As a social science document, the life history should be constructed to illuminate socially significant features of the persons' life.
Documentary sources such as letters, contemporary reports or newspaper descriptions are used to expand and check the validity of information provided by the subjects.

Life history approach is different from biography, as life histories do not necessarily cover the whole span of an individual's life. You will not be able to incorporate all of the dada into the life history. Some stories and topics will not be relevant to your research interests and can be put aside. You may study some successful individuals so that others may share their experience. You can also study some people who have failure in some aspects of their life.

3.8. Diaries

Diaries are sometimes used when social scientists, particularly sociologists, want to keep the day- to day activities of individuals in a particular social environment, Fieldwork and surveys may not give us enough information about the regular round of people's lives, so if we want to build up a picture of what they do at various parts of the day, and at different times of the day or month, it is often helpful to get them to keep their own records. Once again, there are very few studies, which rely upon such information alone it is nearly always used alongside material gathered by other methods. Compared to survey, diaries are more reliable because they minimize problems of bias in retrospective recall and can ensure freedom from interviewer effects. However, there are problems associated with selection or volunteer bias. Thus, incentives are often paid to motivate diarists to continue for the full term of their diary keeping.

3.9. Conversation Analyses

Tape- records and videos are increasingly employed in social research, particularly sociological research. Both frequently used in conversation analysis, the study of how conversations are carried on in real- life setting. Using a tape- recorder, all the audible characteristics of a conversation between two or more people can be put on record. Since when we talk to one another we also use facial expressions and gestures to convey meaning, Video-recordings provide an even more complete register of the unfolding of a conversational exchange. Although much of the richness of the original context is lost, by the use of appropriate notation recorded conversations can then be transcribed on to the printed page.

Many studies involving conversational analysis have been published over the past few years, offering a variety of insights into the nature of human interaction. An example is William B. Sander's study of a very special type of conversation: police interrogations. Interrogation involves conversation, but not just any 'talk' –as is indicated in one of the favorite phrases of police melodramas, 'I will ask the questions'. Sanders was able to analyze the distinctive character of interrogation so as to highlight features that might otherwise escape notice. For instance, interrogators often do not actually say very much at all, stimulating the victim to talk by grunts and deliberately prolonged pauses.

Conversation analysis can only be utilized in small settings, and frequently covers what might seem to be purely trivial aspects of day-to day life, but its importance in sociology is much greater than it might appear. Conversation and talk, after all, are universal features of social activity in both informal and more structured settings of interaction.

3.10. Case Studies

The term *case study* comes from medical research and refers to the intensive study of a single person having some disease. By understanding the single case fully, doctors, for example, are able to diagnose and treat other persons with similar symptoms more effectively. Psychologists adopted the tradition of case studies for research on personality and psychological disorders. From psychology, the method spread to other social sciences and to management studies.

In social research, case study methods are used to conduct in-depth investigations of a single person, village or community, a business organization, or some other entity. Case studies almost always are based on a multi-method of collecting data. Qualitative methods are generally used, mainly in the form of unstructured interviews and observation. Available data are always analyzed to the fullest extent possible. Surveys are frequently conducted as part of case studies. Results are generally expressed in narrative form, with rich, detailed descriptions of the essential features of the case being investigated. Using all available data, the investigator seeks to understand the case thoroughly, as an integrated whole.

The findings of a case study usually evolve from successive analyses of data. Generally the investigator begins by describing each subsystem of the unit being studied as fully as possible. In a community case study, for example, the researcher would analyze data to describe the main community subsystems, such as functions of the marriage and kinship system, how the economic life of the community is organized and carried out; how the religious system functions; and how civil order is maintained. Descriptions usually evolve, becoming progressively more detailed and comprehensive over the course of the fieldwork. When gaps or contradictions are found in the data, the investigator seeks further data. Refinement continues until each major system or functional part of the unit is fully understood and described in detail.

While analysis is going on, the researcher looks for interrelationships among the parts of subsystems. In a community study, for instance, one may see that certain changes are

occurring in both the marital and kinship systems and the economic system. At some point, the analysis would shift to analysis of relationships among changes in the marital and kinship system with changes in the economic system. The ultimate objective is to describe the case as a whole, showing how the parts of subsystems fit together, influence one another, or how they are changing.

3.11. Triangulation

All research methods have advantages and their limitations. Hence it is common to combine several methods in a single piece of research, using each to supplement and check upon the others, a process known as triangulation. We can see the value of combining methods- and, more generally, the problems and pitfalls of real sociological research – by looking at a specific research study.

Triangulation is the use of different research approaches and procedures in one study. The use of different methods helps to achieve greater validity and reliability than a single methodological approach. We can have three types of triangulation.

1) **Data triangulation** where data are collected from different sources or at different times.
2) **Investigator Triangulation** where different researchers collect data on the same issue independently and compare results.
3. **Methodological Triangulation** where two or more research methods are used.

3.12. Participatory Rural Appraisal (RRA/PRA)

Chapter 4 - Writing Research Proposals

4.1 Introduction

Research is a systematic collection, analysis, and interpretation of data to answer a certain question or solve a problem. Doing research is an arduous task. It is fraught with various crucial decisions that have to be taken in order to bring any research task into its fruition. This should not however detract you from doing research. To undertake an effective research you must develop a proposal, which details the procedures to be followed in conducting the research. A Research proposal is a written account of the research topic you have chosen. It is the document which describes your plan of action and research design. A typical research proposal states the problem, identifies the methodology for gathering information relating to the problem, defines the procedures for analyzing the information and states how results would be communicated. The main questions that you have to answer when writing your research proposal are:

1) Is my proposed research interesting, important and relevant?
2) Who has already done research in this area?
3) What are my aims, objectives, research questions or hypotheses?
4) How do I intend to conduct the research?
5) Where do I intend to do the Research?
6) What is my timetable for conducting the research?
7) What do I expect the outcome of the research to be?

The proposal tells the readers why you should be allowed to proceed with the research. The readers could be university professors in case of academic research, fund givers or sponsoring organizations. In order to convince your readers, your research proposal should show that:

1. You are familiar with researches that have been carried out in your research area. This is important to show that you are not simply duplicating researches that have already been done. Ideally, previous researches guide you on what is feasible or not, in addition to guiding you on the selection of suitable research instruments that have proved successful in generating relevant data.

2. You are familiar with what methods you are going to use in finding answers to the questions that are raised by your research. This will help the readers to gauge the extent to which the proposed study is feasible, or that the research will have a high degree of success.

Many seasoned researchers will tell you that once you finish writing a proposal; half of the work is already done. Data collection becomes fairly straightforward once you have thought through your proposal. Subsequently, report writing becomes an exercise of filling in information. In most cases, many research supervisors require that researchers develop dummy tables before they go to the field. The purpose of doing this is to ensure that the researcher knows what data are required, and how such data are to be used to attain research objectives. In other words, this will save researchers from collecting irrelevant and/ or redundant information that is not going to be used in the study. For instance you will not

collect data regarding the age of informants if age is not one of the variables of interest in your research.

4.2 Content and Format

Different organizations or institutions may have their own preferred proposal format. Ideally, they also provide guidelines for proposal preparation. Whatever specific format you might follow, a research proposal will always consist of elements presented in **Box 4.1**.

Box 4.1. Elements of a Research Proposal

1. Proposal Abstract
2. Introduction/background
3. Statement of the research problem
4. Research questions and hypotheses
5. Conceptual framework and definitions
6. Research goals and objectives
7. Justification /significance of the study
8. Study design
9. Analysis plan
10. Plan for interpretation
11. Plans for reporting your findings
12. Logistics and budget breakdown
13. Timetable /work schedule
14. Review of related Literature
15. References
16. Appendices.

However, it should be noted at the beginning that the proposal structure presented here should be seen as a general guideline to proposal development. The use of the sub-headings is designed to indicate what must be included in a research proposal. Some people condense the structure all together and come up with only a few headings. When this happens, what matters is the inclusion of the various aspects indicated in this format. Flexibility in proposal format is encouraged and should be linked to the requirements of the consumer of the document. For instance, at the university level, every department or faculty may have its own recommended format. Sometimes even with in the same faculty, two or more formats could be acceptable

Proposal Abstract

Abstract is the summary of the proposal document. It usually appears at the first page of the document. Though it appears at the first page, it is written after other sections of the proposal are completed. Proposal abstract should be brief and clear, usually not more than a page or half. It should be short and self-explanatory. The proposal abstract should give information about**:**

- The Research problem
- The research questions /hypotheses
- Objectives of the study
- Who will conduct the study?
- When will the study be conducted?
- Where will the study be conducted
- What methods would be used? (Data collection, & analysis methods)

Introduction/Background

This is the most critical stage on your way to successful selection of the research problem and hence field work. It is in this section that the general overview of the research is introduced. Here, you must make an important decision on whether you will merely introduce your problem of research interest in a section called **introduction** or it will be in a **background** section. In some instances, the sections introduction and background seem similar and are used interchangeably. In most practical cases, however, the **introduction** section serves a different purpose from that of the background section. In an introduction, your major concern is to open up your specific area of interest for discussion or usher in the gist of the identified problem. In this case, a relatively short passage is required in which the main points of your research focus is discussed and the scope or coverage of the study is indicated.

A background section on the other hand, is more than an introduction. When the research problem is unique or when your audiences are not familiar with the problem at hand, you may want to provide a **background.** For instance**,** you may want to describe the problem with in a particular historical context or perspective, thus relating the specific problem of your interest to other problems or issues. In any case, the pertinent issues to be considered in this first section include: what is going to be investigated? What is the most concise and precise way of formulating the problem and its basic questions to which answers are sought? What kind of relationships are to be explored, analyzed, demonstrated? What kind of argument does the study seek to make?

Statement of the Research Problem

Having provided the background or the introduction to your study, a clear statement of the research problem should be formulated. While the background or the introduction focuses on the problem leading to the study, the statement of the research problem should establish the direction of the research or present the essence of the study concisely. In other words, the statement of the research problem should provide a specific and accurate synopsis of the overall purpose of the research. Stating the research problem precisely is crucial because a clear statement of the problem:

1. is the foundation for further development of the research proposal (objectives, methodology, budget, and work plan),
2. makes it easier to find information and reports of similar studies from which your study design can benefit,
3. enables you to point out why the proposed research should be undertaken and what is expected to be achieved from the study results.

Statement of the problem should provide: (1) an analysis of the major factors that may influence the problem and a convincing argument to show that available knowledge is insufficient to solve it, and (2) a brief description of solutions tried in the past, how well they worked and why further research is needed.

Research questions and Hypotheses

Based on your experience or review of related literature, it might be possible to develop explanations for the problem which can then be tested. If so, you can formulate hypotheses in addition to the research objectives. In most cases, however, researchers feel the need for research questions because they do not have enough insight into a certain problem or phenomena. In such cases, research objectives and / or questions would be formulated.
A question is to be answered while a hypothesis is to be tested. Questions require information like how much? What? Where? When? Which? Depending on the type of the research problem that is being studied, different types of questions may be asked as indicated in table 4.1.

Table 4.1 Research Problem vs. Research Question

Problem	Type of research question
Knowing that a problem exists, but knowing little about its characteristics	What is the nature and magnitude of the problem? Who is affected? How do the affected people react or behave? What do they know, believe and think about the problem?
Desiring to know why a certain problem or phenomena occurs; want to establish the extent to which a particular factor causes or contributes to the problem; suspecting that certain factors contribute to the problem	Why is a certain phenomenon or problem prevalent or widespread? What is the cause of the problem? Are certain factors indeed associated with the problem? Will the removal of a certain factor prevent or reduce the problem?

A hypothesis is an idea or suggestion stated as a starting point for reasoning. It is designed to make predictions about relationships between dependent and independent (cause and effect) variables.

Examples

1) The number of children may be lower as level of education increases
2) Education of girls appears to increase age of first marriage and thus reduce fertility level
3) Education of girls appears to increase their contraceptive use and thus reduce fertility level
4) Children born to wealthy families are more likely to join higher education.
5) Poor households are likely to have larger family size

Conceptual Framework and Definition of concepts

A Conceptual framework is the anticipated cause and effect relationship between conceptual Variables. Conceptual framework deals with the interrelationship between key variables or

issues to be studied. It can be changed or modified. It can be presented by narration using words or can be depicted graphically as indicated by **Figure 4.1.**

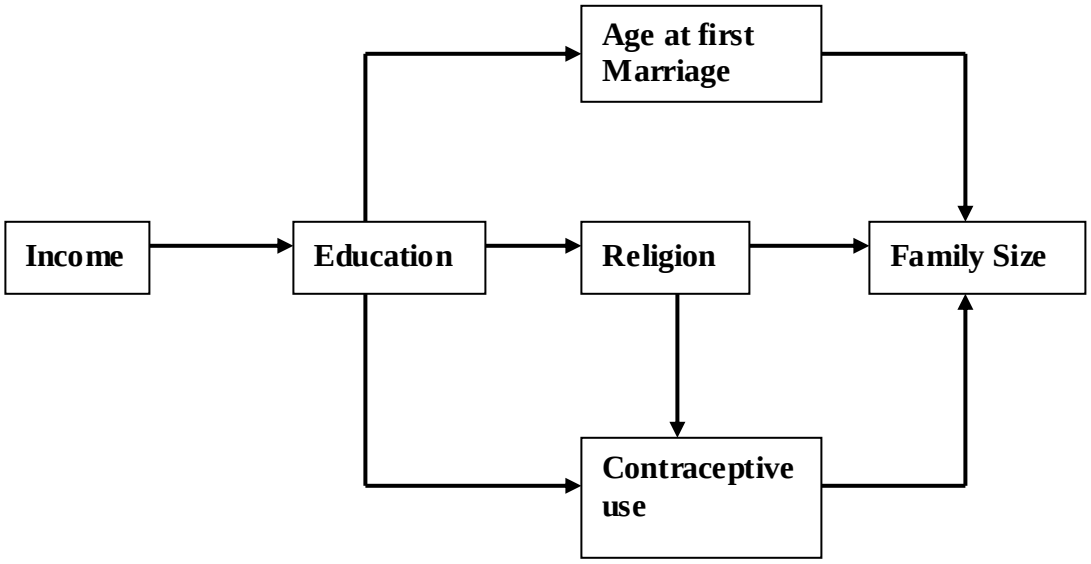


Figure 2.1: Graphic Illustration of a Conceptual Framework

Major concepts of the framework have also to be defined in order to facilitate understanding. We have two types of definitions: **conceptual and operational definitions**. A concept is a mental image that summarizes a set of similar feelings or ideas. For example, we experience a bundle of feelings and call it **love.** We see that some people have little to live on and call it **poverty**. Since no concept has any ultimate or real meaning, each of us gives different shades of meanings to the concepts we use. So, conceptual definition is a process of specifying what we mean by terms like poverty, social status, prejudice, alienation, etc. Conceptual definition is synonymous with dictionary definition. Operational definition is the process whereby the researcher specifies empirical observations that may be taken as indicators of attributes contained within a given concept or variable. Operational definitions specify precise operations to be followed in measuring variables. (For more details on conceptualization and operationalization, **refer chapter 5**)

Research objectives

You should state clearly the general and specific objectives of your research. General objective refers to the ultimate goal which is to be achieved at the end of the research project (outcome). Specific objectives are activities to be accomplished by the researcher and lead to the achievement of the general objectives. Specific objectives usually describe what will be done in the research process like: to evaluate, describe explain or to test. They should specify what you will do in your study, where and for what purpose. Keep in mind that when your research project is evaluated, the research results will be compared to the research objectives. If the objectives have not been spelled clearly, the result of your research can not be evaluated

Objectives should be closely related to the statement of the problem. For example, if the problem identified is low utilization of child welfare clinics, the general objective of the study could be to understand the reasons for this low utilization in order to find solutions. The formulation of research objectives will help you to:

- Focus the study
- Avoid the collection of data which aren't strictly necessary to address the problem you have identified.
- Organize the study in clearly defined parts or phases.

Justification (significance)

How important is the problem? Is it really worth doing research? Because you have to spend your time and other resources, you have to do some thing which is valuable. What is the relevance of the study? Justification is the means of convincing supervisors or sponsors to approve your research project. While working justification consider**:**

1) Is the problem current and timely?
2) Does the problem have serious consequences? Is it an important policy issue?
3) Does the problem affect or potentially affect large number of people? Is it a National, Regional, Local, or Global issue?
4) Does the issue have social, economical, political, or scientific implications?

Study Design

Study design is an arrangement of methods and tools of data collection and analysis. It aims at combining the purpose of the research with the available resources. The objective of the research and the availability of resources determine the research design. Study design includes:

1) Description of units of analysis
2) Coverage
3) Time reference
4) Description of data Collection procedures

1) **Description of units of analysis** refers to the statement of what or who is going to be studied. Individuals? Groups? Institutions? Organizations? Communities? Etc.

2) Coverage refers to the target population for whom generalization is to be made. For what population will the study refer to? Coverage also refers to the extent of issues and concepts to be dealt with. It decides what the focus of the study is, and what is not.

3) Time Reference identifies the duration of time the study covers. When the study is concerned with a point in time then it is cross-sectional study. And when the study is concerned with trend analysis or change in time, it is longitudinal study.

4) Description of Data Collection Procedures

a) Discuss the research methods to be used

b) Indicate data collection instruments (Questionnaires, Interview guide, Discussion guide)

c) Discuss the confidentiality of the data: what is your mechanism to keep the confidentiality of respondents? You can use code numbers instead of naming the respondents.

d) Describe procedures used to control data quality. How do you maximize the validity and reliability of data? You can use:

- Pre-testing of data collection instruments
- Post testing /Re-interviewing
- Training data collectors and supervisors
- Indicating multiple sources of information
- Using crosscheck questions or consistency checks.

Pretesting is used to modify data collection instruments and other data managing procedures. Posttest is commonly used to check the reliability of data. Pretest is done with other groups while posttest is done with some of the research participants. Training data collectors and supervisor helps to:

- Minimize problems of validity and reliability
- Make data Collectors familiar with the issue
- Enhance the capacity of supervisors to check and coordinate the data collection process
- Complete questionnaires according to the pre-designed plan
- Correct errors on the spot, check missing information and fill on the spot.

Analysis plan

The main purpose of data analysis is to answer questions or test hypotheses. When data collection methods are decided, the researcher has also to think of data analysis. Data collection and data analysis should not be viewed separately. The type of data analysis depends on the type of data collected. For example:

- Quantitative analysis needs large sample size, and probability sampling
- Qualitative analysis need small sample size, and non probability sampling
- Descriptive analysis needs descriptive statistics only
- Explanatory analysis needs inferential statistics

In your analysis plan, discuss data preparation and data analysis procedures.

Data preparation: Before analysis, the data should be checked for accuracy. If there are errors in the data they will be reflected in the analysis result and the outcome will be of no use. Data preparation involves:

1) Tabulation = presenting the data in tables
2) Coding = translating verbal responses into numerical codes, and all open ended questions should be categorized and coded
3) Editing for accuracy of data and correctness of tables and codes.

Data analysis involves: univariate, bivariate and multivariate analyses

Plans for Interpretation

Your discussion of the research design and analysis plan will provide you guidelines how to interpret your data. In your plan for interpretation discuss:

1) ***Generalizability*: -** indicate the target population in time and place to which the results of the study can be generalized.
2) ***Limitations*** **-** What would be the limitation or the shortcoming of your study? What problems would you face in your research or what data would be lacking to make your generalization complete? Can readers accept your generalizations as it is or with what caution?
3) ***Potential Contribution of the research findings*** **-** what will be the importance of your research result? Who will benefit from the research?

Plans to Report Research findings

1) What reports are to be prepared? (Interim report, final report, publication in the form of book, journal, article, or news paper)
2) Medium of Presentation and dissemination: (seminars /workshops/ conferences, submitted to policy makers and beneficiaries, accessed through libraries)

Logistics & Budget Breakdown

- Indicate the sources of the fund
-Mention the necessary logistics
-Indicate the anticipated cost breakdown
    - Personnel expense (Salary & per diem)
    - Supplies & Equipments
    - Traveling Cost
    - Miscellaneous – unmentioned expenses
    - Contingency- Cost fluctuation (5 - 10%) of total cost

Work schedule /Time table

The amount of time each step takes should be indicated and you should be committed to accomplish the work according to the timetable.

Review of related literature

Review of literature should focus on the following important issues

1) ***Identifying critical areas for research***, i.e., indicating the areas/ issues where no research has been done, and shortcomings of previous research in the area.
2) ***Indicating major findings of previous studies including***
    - Study location and time
    - Study design and procedures
    - Variables included and controlled
    - Results obtained
3) ***Commenting on the Validity and Reliability of previous studies*:** Discuss and Comment whether the researchers used appropriate methodology of data collection and analysis. Indicate the limitations of previous studies.

Reference

A Reference is an alphabetical list of materials from which you have obtained information. Some authors draw a distinction between references and bibliography. Whereas references are detailed lists of the sources which have been cited in your text, bibliography includes items which were not cited in the text but are relevant to your text. Other authors use the terms interchangeably. Accurate citations and references are important because:1) they help readers of your report to distinguish between your own ideas and those taken from other sources; 2) they enable readers to refer to the original sources; 3) they protect you in the event that the information in the sources is erroneous.

There are various ways of making references all of which contain the same information but displaying it differently. Different publishers may have their own styles of referencing. Before recording references, you need to checkout if your university/department has a preferred way of preparing references. If your university does not have a preferred format, use the formats shown in **Box 4.2**.

The first reference in **Box 4.2** shows how to prepare a reference to a book. As you see, the last names of authors are listed first followed by their first names (note that Ethiopian names are not reversed). Then comes the year the book was published, set off in parentheses. The next element is the title of the book. The title is placed in *italics* with the first letters of the main words in the title capitalized, and a period placed at the end of the title. Then comes the name of the city where the book was published, followed by a colon, and then the name of the publisher of the book. The end of a reference to a book is marked by a period. Sometimes you may have to refer to more than one publication by the same author in the same year. When this happens, add "a," "b," "c," etc., to the year, as (1999a), (1999b), or (1999c), to differentiate among publications by the same author or authors in the same year.

For an editorial book, referencing is the same except the word editor (ed.) is placed following the name of the editor who compiled the book. In the case of a chapter that appear within an editorial book, the title of the chapter is listed within inverted commas, followed by the word ”In” and the name of the editor followed by (ed.), and then put the full reference of the book.

Often, many government ministries and other organizations publish books/ research reports. Librarians refer organizations that publish a report as the *corporate author*. When you find that an individual is not listed as the author of a publication, list the organization that published the report as the author of the report.

For a journal article, the title of the article, ‘within inverted commas’, is placed next to the year of publication. The first letters of all words except prepositions and conjunctions are capitalized: A period is placed at the end of the title of the article. The title of the journal that contained the article is placed next. The first letters of main words in the title are capitalized and the journal title is placed in italics. A period is placed at the end of the journal title. The last element in a journal reference contains the volume number, issue number, and the page numbers of the article being cited. When the issue number is used, the volume number appears first, followed by a colon, then the issue number, followed by a comma, and then the

set of page numbers for the article, beginning with the number of the first page of the article, followed by a dash, and then the number of the last page of the article, and ending with a period. Information for creating a journal reference can usually be found on the cover of the journal; on the first page of an article; or in the table of contents of the journal containing the article you are citing.

With regard to referencing documents found on a Web site, the format is the same as for an unpublished report, except that the date when the information was retrieved is given, followed by the name of the site, and its address. No punctuation is used at the end of the reference.

Box.4.2 References

Book with an author

Ritzer, George (2000) *Sociological Theory*, 5th ed. New York: McGraw Publishers.

Editorial book

Coser, Lewis (1967) *The Idea of Social Structure: Papers in Honor of Robert Merton*. New York: Macmillan.

A Chapter in editorial book

John, Adams. "Urban and Regional Planning." In Malpass, Petter (ed) (1990).*The urbanization of the Third world*. Loudon: Macmillan, pp.267-279.

Article in a periodical /journal

Geremew Abate (1992). "Astronomy in Ancient Ethiopia" *Scientific Journal of Ethiopia*. 4: 7, 100 -112.

Dissertation /Thesis /Senior Essay.

Alemu Deneke(1980) "Anthropological Findings in Southern Ethiopia" PhD Dissertation, Uppsala: Uppsala University

Proceedings

Befekadu Degfe "Migration and Urbanization in Ethiopia." In Proceedings of the Seminar on Population and Employment Planning. Debre Zeit , April 13-17,1978

Official reports /memos

Ministry of Health, "Problems Encountered in Areas of Family Planning" (Unpublished Memo) Addis Ababa: Family Health Department, December, 1995

News Paper.

Tesema Tolera "Housing Problems in Addis Ababa." *The Ethiopian Herald*, 5 February 2003, p. 7

Common abbreviations used in reference writing and document citation

Ed. = editor, edition

Et. al = and others
Ibid = as cited above
Op. cit = in the work cited
Passim = here and there
Loc. cit = the place cited
P, pp. = page, pages
No. = number
Np. = no publisher
Nd. = no date
Vol. = volume

Appendix

- Data Collection instruments, a sample copy of your questionnaire
- Letter of support or permission from related institutions
- Contract agreements.
- Other information related with the study

Main points

1. A research proposal is a written account of the research topic you have chosen. A typical proposal states the problem, identifies the methodology, defines the procedures for data analysis, and states how results would be communicated.
2. The content and format of a proposal varies depending on the preferences of organizations or institutions owning the research project. Whatever variations in format and content, proposals commonly consist of elements including: abstract, introduction, statement of the problem, significance and justification, conceptual framework, objectives and basic questions, study design, literature review, analysis plan, timetable, and budget breakdown
3. A proposal abstract is a concise summary of the proposal document in not more than one page long.
4. The introduction part of the proposal gives an opening remark to your identified area of study or discusses the gist of the problem under consideration.
5. statement of the problem provides a concise description of the nature of the problem, and analysis of the major factors that may influence the problem
6. While general objective refers to the ultimate goal which is to be achieved at the end of the research project, specific objectives are activities to be accomplished by the researcher and lead to the achievement of the general objective.
7. A hypothesis is an educated guess stating relationships between dependent and independent variables.
8. Study design is an arrangement of methods and tools of data collection in relation to the purpose of the research and available resources including time.

Review questions

1. Obtain the research proposal format of your univrsity from The Research and Publication Office. Compare and contrast the contents and elements of the format against the proposal format described in this chapter.

2. Get a model research proposal from any friend of you or from the internet and discuss the elements contained in the proposal. Match contents of each element in the proposal against the contents discussed in this chapter.
3. Select a research topic and develop a proposal following the procedures discussed in this chapter.

Chapter 5 - Survey Research Methods

5.1 Introduction

A Survey is a research method whereby a sample of study cases are selected and studied to make inferences about the population from which the sample cases are selected. The premise of survey research is the assumption that the best way to gather certain types of data is by asking questions. Survey research provides the best teaching example for instruction in social science methodology. The student who fully understands the logic and skills of survey research will be excellently equipped to learn and use other social science methods as its assumptions, limitations and approximations are clearly visible than in other social research methods. Hence it serves a peculiar pedagogical function.

5.2 Characteristics of Survey Research

Surveys conducted for research purposes have three distinct characteristics: **First,** Survey research is a quantitative method, requiring standardized information from and/or about the population being studied. As a result, most surveys produce a large amount of data. The only practical way to analyze data from most surveys, therefore, is by means of statistical analysis. This may be done by hand, although today computer-based software packages speed up analysis and removes a large source of errors that can occur with hand analysis. Also, use of a statistical software permits more extensive and thorough analyses of data. *Quantitative research* is usually based on:

- Careful and precise specification of the question to be answered;
- Identification, definition, and measurement of the key variables;
- Selection and specification of one or more methods of collecting data;
- Development of a sampling plan; and
- Numerical analysis of the data, including use of appropriate statistical tests.

Second, *Use of questionnaires:* A questionnaire is a carefully prepared set of questions designed to produce the data needed to answer a research question. The term *item* is generally used in place of question because questionnaires frequently contain statements that respondents are asked to respond to in addition to questions. The main way of collecting information is by asking people structured and predefined questions. Their answers, which might refer to themselves or some other unit of analysis, constitute the data to be analyzed.

Third, *probability sampling*: Surveys can be conducted by asking all members of the entire target population to respond. This would result in a census and any calculations, such as percentages or means, would represent the parameters or values for variables for that population. Census surveys, however, are practical only when populations are quite small. For larger populations, sampling is the only practical way to collect data. Sampling is concerned with drawing individuals or entities in a population in such a way as to permit generalization about the phenomena of interest from the sample to the population. The most critical element of the sampling procedures is the choice of the sample frame which constitutes a

representative subset of the population from which the sample is drawn. The sample frame must adequately represent the unit of analysis. Sampling is also concerned with representativeness in selection of individual respondents from the sample frame.

5.3 Unit of Analysis

In designing survey research you also have to decide on what basis you will analyze the data you will collect. This requires a decision about the *unit of analysis* for the study. Units of analysis may consist of individuals, groups, organizations, geographical places, or other entities. Generally the way you state your research question indicates which unit will be used as the basis of analyzing the data.

Individuals as the unit of analysis

When the purpose of research is to say something about individuals, they become the unit of analysis. Individuals are the most frequent unit of analysis.

Groups as the unit of analysis

Research is often conducted by collecting and analyzing data for groups of people. When the purpose is to describe two or more persons as a unit, these groups become the unit of analysis. Households, consisting of various numbers of persons, often are used as the unit of analysis. Other units of analysis at the group level include friendship groups, clubs, social groups, and groups of street children.

Organizations as the unit of analysis

Research often is directed at learning about organizations, such as businesses, firms, ministries of government, universities, political parties, religious bodies, or military units. Although data about each organization may be obtained by interviewing members of an organization, the data would be used to describe and compare features of each organization.

Geographical places as the unit of analysis

Places, such as where people live, can also become the focus of study and therefore be used as the unit of analysis. Cities, provinces, and rural versus urban areas are used as the unit of analysis in most reports issued by international organizations. Countries frequently are used as the unit of analysis. You can study for instance to compare the extent to which developing countries meet the social needs of citizens, or in comparing infant mortality rates throughout sub-Saharan African countries. **Box 5.1** summarizes frequently used units of analysis.

Box 5.1. Some frequently used units of analysis

1. Individuals - by far the most frequently used
2. Groups- husband-wife pairs, social groups
3. Organizations—businesses, offices, factories, government ministries
4. Classrooms, schools, university student bodies or groups
5. Geographical areas- villages, communities, cities, regions of a country, entire countries
6. Mass media materials- newspapers, magazines, television shows

Deciding on the unit of analysis

Most likely the unit of analysis you will use in a study will be clear from the way you defined your problem. If you have any doubts about the unit you should use, you will need to resolve this confusion before going on. Otherwise, you may not analyze your data properly and your entire study could be jeopardized. Ask yourself what unit you will base your analysis on. This is, as the term implies, your unit of analysis. Also, in the process of analyzing your data, you may shift from one unit to another. Our point is simple: just be sure of your unit of analysis and that you have data appropriate to that unit.

Collecting data at the lowest possible unit

Also, remember an important rule: Regardless of what you are studying, always obtain data in terms of the lowest unit of analysis possible. For example, if you intended to analyze data about the production of things by households, collect data about the production activities for each member of the household. Then you can combine the data from each household member for analysis at the level of the entire household. This way you can still do other analyses at the level of members of the household, such as what wives and daughters produced in contrast to husbands and sons, as well as for the entire household. But if you asked only for production of the household as a whole, you would not be able to describe production by separate members of the household.

Confusion arising from multiplicity of units of analysis and Ecological Fallacy.

The applicability of survey methods to various units of analysis may sometimes confuse the beginning researcher and result in the selection of an inappropriate unit of analysis for a particular line of inquiry. The danger of ecological fallacy, which is a serious problem that crops up particularly when one is working with aggregated data, arises from a mix-up of units of analysis. Ecological fallacy is misrepresentation arising from incorrect unit of analysis. To illustrate this let us take two examples**:**

Example 1: While Durkheim found suicide rates consistently higher in predominantly Protestant areas than in predominantly Catholic areas, he had no way of determining whether

the Protestants were committing suicides. Conceivably Catholics living in predominantly protestant areas could have the highest suicide rates of all.

Example .2: A research is aimed at examining the relationship between race and crime: Are blacks or whites more likely to engage in criminal behavior? The appropriate unit of analysis for this inquiry would be the individual person. Sample of black and white respondents might be studied and their respective crime rates computed and compared.

But, how about if the researcher decided to use already existing aggregate data on the overall crime rates for major American cities, that are also given by race. While analyzing such data he might discover that crime rates were higher in cities containing a higher proportion of blacks in their populations. Then, he might conclude from this, that blacks have higher crime rates than whites. This line of inquiry suffers from ecological fallacy in that the researcher has no assurance that the crime committed in predominantly black cities were Committed by blacks. It would be conceivable that the highest crime rates occur among whites living in predominantly black areas (as alienated, poor or declassed whites usually live in black areas). Such misrepresentation would not have been possible had the researcher employed the correct unit of analysis.

5.4 Survey Designs

Another important issue is design for data analysis. Data produced by a survey comprise the answers to questions which respondents of the survey have been asked, or which have been collected through secondary sources, or both. These questions may all refer to one point in time, but more typically, they refer to several different points in time (present, immediate past, distant past, future). Designing research is a creative process. Designs can be put together in a number of ways. By describing some of the more frequently used designs; we hope you will get an idea of the various kinds of research questions you can ask and designs you can use in answering them.

There are two basic types of survey designs:

- Cross-sectional surveys, and
- Longitudinal surveys

However, as a third type of survey design the use of cross-sectional surveys to approximate longitudinal surveys may be added.

Cross-sectional surveys:

Cross-sectional surveys are designed to describe some set of variables as they exist at the time of data collection. Data are collected from a sample over a relatively short period of time. The design is called a *cross-sectional* design because the sample is carefully selected to represent the cross section of some population. In cross-sectional surveys, data are collected at one point in time from a sample selected to describe some large population at that time. Such surveys can serve not only descriptive but also explanatory purposes. For example, a cross-sectional survey

may be employed to explain the relationship between religiosity and prejudice, describing the relationship between the two variables at the time of the survey. The researcher reports his findings as an explanation that could or even might have changed later on. Hence it is possible for a subsequent survey to uncover a different relationship. That is why we normally report survey findings in the past tense.

Longitudinal surveys:
All survey designs that permit the analysis of data overtime are subsumed under the term longitudinal surveys. In these kinds of surveys data are collected at different points in time, and this allows the researcher to report changes that can take place between the different points in time. Longitudinal surveys can of course serve both descriptive and explanatory purposes, and are able to report changes in both the descriptions and explanations they furnish. Longitudinal design is again sub-divided into three primary designs. 1) Trend studies, 2) Cohort studies, and 3) Panel studies.

Trend Studies: This, as its name suggest is a survey design used in the study of trends in which different samples are selected from a general population and studied at different times. While different persons or cases are sampled and studied in each survey that are conduced at different times, each of this samples represents the same population but at different time. Hence, such studies involve a rather long period of data collection. For Example: In the ongoing study of prejudice in America, surveys have frequently asked respondents whether they felt that black and white children should attend the same schools. Over the years, the percentages favoring integrated schools has consistently increased. These data permit the researcher to note trends in attitudes of a general American population toward integration. Note also that trend studies can be used not only to provide description but also explanation, as they can be used to study the relationship between two or more variables. For Example: The relationship between religious affiliation and political preference. Traditionally Catholics and Jews in America have been more likely to vote for the Democratic Party than have Protestants, but the researcher might examine this relationship over time.

***Cohort Studies*:** The word cohort refers to persons that are banded or grouped together, or a batch. Cohort study is a survey design used in the study of processes. Trend studies are based on descriptions of a general population over time, and the members of that population will change in the course of the study through death and birth. Hence a trend study of attitude among students at a given university will reflect a different population of students each time a survey is conducted. Cohort study on the other hand, focuses on the same specific population each time data are collected, although the samples studied may be different.

Example 1: Different samples are selected at different times, at 5 years interval, from the student population graduating from a given University in the class of 1990, to determine their attitude toward work. Thus, while the sample would be different each time, we would still be describing the class of 1990, i.e., a specific population (If we studied the graduating class of 1995 the second time around, we would of course have a trend study of graduating classes rather than a cohort study of the class of 1990).

Example 2:.At one point in time the researcher might sample from among all Americans in their twenties. Ten years later, he could sample all persons in their thirties and so forth. This would constitute a cohort study of a given age-group. Also, this could be accomplished through a secondary analysis of previously collected data (e.g. attitudes of 20 years-olds in a 1940 study, 30 years-olds in a 1950 study, etc.)

***Panel Studies*:** A powerful way of conducting a longitudinal study is to collect data at successive times from the same sample. The sample for such a study is called the panel. The time periods involved can range from weeks to many years. Panel designs are particularly useful for detecting changes in variables, but they have the disadvantage of the loss of respondents over time. As the initial sample gets smaller, it becomes less like the original sample, and hence comparisons among the waves of data collection can become less meaningful. When the time period is relatively short, over several months for example, losses generally are not too great. Over longer periods of time losses in respondents inevitably occur. Causes include death, illness, moving away, lose interest, or refuse to cooperate after several periods of data collection. Careful researchers report losses in samples used in panel designs and discuss the possible effects of the losses on the findings.

***For example*:** in a Political study, the researcher might interview all the members of his panel at one-month intervals throughout the campaign. Each time he would ask them who they plan to vote for; then when switching occurred he would know which persons were switching in which direction. By analyzing other characteristics of the "switchers" and "non-switchers," he might be able to explain the reasons for switching. Panel studies are used to overcome the limitations of trend and cohort studies. While the researcher may determine through a trend study the voters as a group switching from candidate A to candidate B, he cannot tell which people are switching, thereby hampering his attempts to explain why switching is occurring. Except for certain limiting cases, panel studies would have to be conducted as part of a particular research program. Panel studies are difficult to conduct, however, for the following reasons.

1) Panel studies (unlike trend and cohort studies) cannot be carried out through a secondary analysis of previously collected date. Therefore, it is expensive & time consuming.
2) Its second problem is panel attrition which refers to the extent of non-response that occurs in later waves of the study due to some of the interviewees who are unable or unwilling to be interviewed.
3) Thirdly the analysis of panel data can be rather complicated. The chief analytical device is the turnover table, which cross-tabulates a given characteristic at more than one point in time. As the number of surveys increases, the number of variables and the complexity of those variables increases, the analysis and presentation of the data can become extremely complicated.

Example: Those preferring candidate A in the first survey are divided into those who still prefer him and those who prefer candidate B in the second survey. Those who prefer candidate B the first time are likewise divided. Thus, as the number of surveys increases, the number of variables, and the complexity of those variables increases, the analysis and

presentation of the data can become unmanageable. Due to all its problems, panel studies are less frequently conducted in survey research.

Approximating longitudinal designs

Although longitudinal studies provide the most trustworthy data about changes and processes in time they are highly expensive and time consuming. Cross-sectional survey on the other hand is time-saving and cost effective because of its one-time data collection and analysis However, researchers, more often than not, are interested in answering research questions involving processes or the notion of change overtime which is an aspect that is properly handled through longitudinal surveys. To gain from the merits of the two designs, certain devices are employed in a cross-sectional survey for approximating the study of process or changes over time. The devices used are the following:

1) ***Asking Respondents Furnish Data relevant to the past*** Respondents in a given cross-sectional survey may be asked to provide data relevant to past events in addition to present ones. For example, a researcher collects data on family income for the current and for the previous year. The researcher then uses these data as though generated in two waves of a panel study. Two possible dangers exist, however:

A) Lack of accuracy on behalf of respondents

B) Researcher might be misled into interpreting the earlier-year data as a cross-section of the population at that time, since this sample is limited to the present population (e.g. before and after famine).

2) Age or Cohort Comparisons. Age or Cohort Comparisons within a cross-sectional survey may be used to approximate a study over time.

Example1: Young people in a given study may be less religious than old people, and the researcher might interpret this as a decline in religiosity in the population. (But care must be taken since people tend to become more religious as they grow old).

Example 2**:** you may) compare attitudes of first and fourth year university students towards Women with regard to working in rural areas, combining family and professional roles, and getting involved in political activities. In general, the fourth-year students may express more positive views with regard to all three "modern" roles. You may then conclude that university experience tends to move students toward a more modern perspective. This conclusion, however, is based on the assumption that three years later, the first year students would express attitudes similar to those of the current fourth-year students. This kind of assumption is common to studies based on the approximation to a longitudinal study. Researchers using this technique should explicitly acknowledge any assumptions they are making and provide sound reasons for any conclusions they offer.

3) Logical interpretation of cross-sectional data to indicate process overtime**:** Cross-sectional data may sometimes be interpreted in logical terms to indicate process overtime.

Example: Students who reported they had ever used marijuana also report past experience with alcohol. Moreover, all those who reported they had ever used LSD reported they had also used marijuana (and alcohol). It is reasonable, then, to conclude

from these data that the progression of drug use over time is from alcohol to marijuana to LSD. The researcher concludes on logical ground, that the progress overtime was from alcohol to marijuana to LSD.

5.5 Planning a Survey

Figure5.1 displays the typical steps researchers follow in planning and conducting a survey. As with every research effort, the researcher begins by specifying the problem or the question to be answered by the investigation. The next step shown in **Figure 5**.1 is to review the literature. **Figure 5.1** shows an additional step - conducting exploratory research. Often, even limited exploration of a topic or problem helps in defining the research question and in selecting wording for items. Exploratory research may be based on informal interviews with persons similar to the respondents who will later be questioned, analysis of comments from members of focus groups, or results from informal, everyday observation of the group being studied.

As shown by the arrows leading back to the research question in **Figure 5.1**, results from the review of literature or exploratory research may lead to modification or even abandonment of the original research question. Following the final decision on the research question, the researcher engages in conceptualization and operationalization of the variables being measured. In survey research, operationalization of variables or indicators is carried out in the way items in the questionnaire are written. The bi-directional arrows in **Figure 5.1** show the interaction that goes on between conceptualization and operationalization. Initial concepts may be modified as operations are defined .The remaining steps are:

- Planning for all aspects of the survey;
- Constructing the questionnaire;
- Conducting the survey;
- Preparing data for analysis;
- Analyzing and interpreting the data;
- Drawing conclusions; and
- Writing the report.

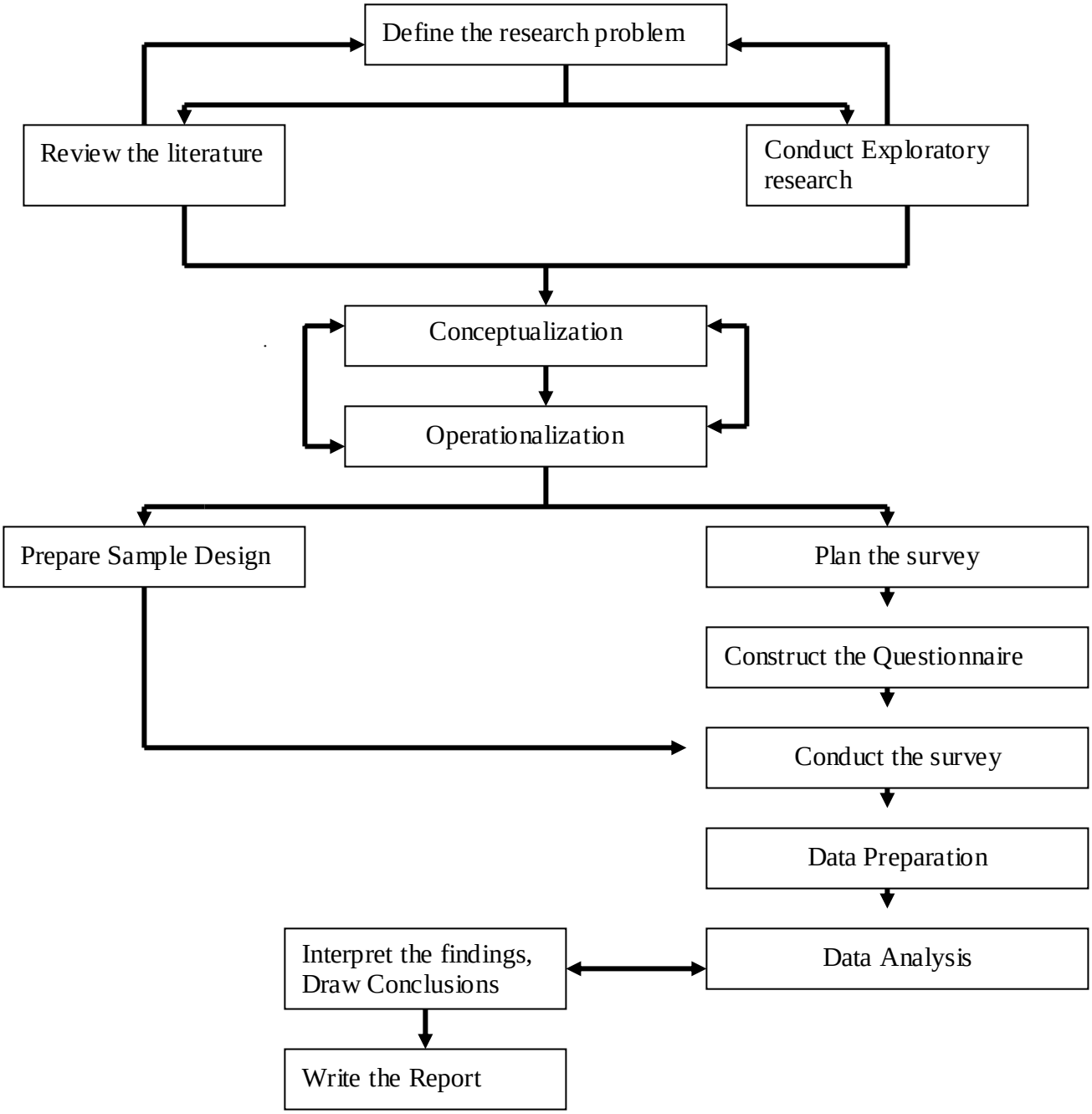


Figure 5.1 Steps in planning and conducting a survey

Conducting a survey requires careful planning and making a number of critical decisions. Two immediate decisions are: What method to use to collect data(personal interviews or some other method)and whether to use a structured or unstructured method of interviewing.

Choosing a data collection method

Personal interviews: In developing countries, almost all surveys are based on *personal interviews* with respondents. Interviews have to be used when respondents are illiterate or are unable or unlikely to complete a questionnaire on their own.

Telephone interviewing: In industrialized countries, where almost every household has a telephone, *telephone interviews* are a preferred method of conducting a survey. Telephone interviews require far less time than personal interviews; however, are more impersonal than face-to-face interviews. It is much easier for respondents to say no to an interviewer over the telephone than to a person standing before them. Also, telephone interviews generally have to be kept brief; respondents are less likely to continue with interviews lasting over ten or twenty minutes. Consequently, only a few, very carefully worded questions can be asked. Still, for some investigations with a target population that has telephones, this method may be appropriate and practical.

Self administered questionnaires: Another way to conduct a survey is to mail or deliver the questionnaire to respondents and ask them to complete the questionnaire on their own. This method can be used with respondents who are literate and who can be trusted to take the time to complete the questionnaire by themselves. Self-administered questionnaires are often used with samples of secondary students or with university students. A commonly used method is to visit with each respondent, explain the questionnaire, leave it with the respondent to be completed, and then return later to pick up the completed questionnaire and review it with the respondent.

When respondents are able to complete a self-administered questionnaire on their own, this technique offers a number of advantages. A large amount of data can be obtained quickly and inexpensively from a far larger sample than by interviewing. Conclusions based on larger samples offer a stronger basis for generalizing to the target population. The down side is that response rates are generally much lower with self-administered questionnaires than for personal interviews.

Since most surveys in developing countries use some form of personal interviewing, the emphasis here will be on questionnaire development for use in personal interview settings. Interviews can be conducted using either *structured* or *unstructured* interviews or some combination of both methods.

Method of interviewing

The choice between these two methods of interviewing usually depends on the purpose of the research. For exploratory and qualitative investigations, researchers usually use semi structured/unstructured interviewing. These interviews are based more on the style of casual, everyday conversation. The researcher starts with a few initial questions and then, depending on the responses obtained, asks additional questions. Responses are recorded or summarized in the words of the respondents. In the course of an unstructured interview, the interviewer may also ask specific questions prepared in advance of the interview. There is no predetermined order in asking questions or in the exact form of questions. Instead, based on

what the investigator wants to learn about and responses already obtained, the investigator decides on the order and nature of questions appropriate at any stage of the interview.

When the purpose of research is to describe a set of variables precisely, particularly quantitatively, structured interviewing is almost always used. This choice leads to construction of a detailed set of questions commonly referred to as a questionnaire. Each respondent is asked each question in exactly the same way, in so far as possible. For most items, responses are recorded by checking one of several response categories.

5.6 Strengths and Limitations of the Survey Method

Like all other methods, survey research has special strengths and limitations. Knowledge of these can help in deciding whether the survey method is appropriate for research you might conduct.

Strengths

The great strength of survey research is that for relatively little cost you can collect a lot of data about a number of variables from a large number of persons. This is particularly true for measurement of quantitative variables using closed responses. With standardized questions, data can be easily aggregated and analyzed using quantitative methods. When appropriate sampling designs are used, results can be generalized to large populations.

Limitations

Surveys also have a number of limitations. The most serious weakness concerns the validity and reliability of responses obtained to questions. Surveys provide only verbal descriptions of what respondents say they do or how they feel about something. Responses cannot always be taken as accurate descriptions of what the respondents actually do or really feel about something. This is particularly true for behavior contrary to generally accepted norms of society. Persons are unwilling many times to indicate they have engaged in behavior not accepted by their group. Researchers do well to remind themselves of this serious limitation as they prepare items and interpret their results.

Improving survey results

There are several ways of dealing with the unpleasant, but stubborn fact of possibly getting false responses. First, try to apply all the guidelines given for writing questions and for organizing a questionnaire. Second, be thoroughly familiar with the group you are studying and use knowledge about the norms and values of this group in preparing the questionnaire. Third, when possible, use multiple methods of collecting data about key variables. Instead of depending only verbal responses for these variables, try to get observational data or look for additional data in census or other reports as well.

For example, if you were asking about how much meat is eaten in a household, try to observe what is actually served at meals over several days for a small sub-sample of the larger sample in addition to asking about this variable in question form. The same method could be used to check the validity of responses to questions about many other variables.

Main points

1. The essential features of a survey are: data collection by means of a questionnaire from a randomly selected sample, and statistical analysis of the data.
2. Preparing for and conducting a survey includes: defining the research question; conceptualizing to identify and define the key concepts; constructing a questionnaire, extensive pretesting of the questionnaire; preparing the final questionnaire; locating members of the sample; and conducting interviews using the questionnaire.
3. Most surveys are conducted by means of personal interviews. Other methods are use of self-administered questionnaires, telephone interviews, and surveys conducted by mail or through a Web site
4. In designing survey, investigators have to be clear about the unit or basis for analyzing the data. Units of analysis may be individuals, groups, geographical areas, or other entities. The unit of analysis sometimes differs from the unit from whom data are obtained.
5. There are many research designs. Some of the more frequently used ones are: cross-sectional designs and longitudinal designs
6. Survey research is best for collecting a lot of data from large samples. Survey data can also be easily quantified and analyzed statistically. When based on a probability sample, conclusions from a survey can be safely generalized to the population represented by the sample. The chief limitation of surveys is that responses may not reflect what respondents actually feel or what they actual do in contrast to what they say in response to a question

Review questions

1. It is described that survey research gives the best teaching example for instruction in social science methodology. Explain why this is the case.
2. Discuss the three characteristics of survey research.
3. Explain why and when we undertake either of exploratory descriptive or explanatory research.
4. What is a unit of analysis? Discuss its differences and similarities from a unit of data collection?
5. Explain what we mean by ecological fallacy. Use examples to illustrate.
6. Identify the major steps involved in planning and conducting survey research.
7. Discuss the following key terms.
    - Cross-sectional survey
    - Longitudinal survey
    - Approximating longitudinal surveys

Chapter 6 - Measuring Concepts and Variables

6.1 Introduction

In quantitative research, developing measures for variables is an important part of preparing a research design. This chapter describes the steps involved in measuring concepts and variables. You will also learn about different levels of measurement and the requirements for developing measures that the scientific community will accept as sound. In addition, this chapter discusses some ethical issues that may arise during the course of research.

Measurement: most simply stated is a procedure for carefully classifying cases or study units and putting them into previously defined categories of some variables. **A variable** is simply any characteristic or property of a study unit that has a series of two or more possible attributes or categories into which the case could be classified. Self esteem is a variable characteristic of individuals. Classifying a person as having "high" or "low" self esteem is an example of a simple measurement process. Likewise, sex, marital status, age, income level and educational status are variable characteristics of individual persons. An ***attribute*** is a specific value on a variable. For instance, the variable *gender* has two attributes: *male* and *female*. Likewise, the variable *family size* has values 2, 3, 4, 5, 6, etc.

6.2 Steps in Measurement of Concepts

Two main steps are involved in developing measures for any concept. First, the investigator has to specify clearly how a concept is defined. This process is known as *conceptualization*. Second, ways of measuring concepts and variables have to be developed. This related process is called *operationalization*.

Conceptualization

In measurement, a necessary step to start is with a conceptual definition of each variable. In order to develop a useful measurement of "self-esteem", for example, you need to define the concept "self-esteem". If you define self esteem as "positive or negative feelings towards oneself". This definition is called conceptual definition. **A concept**: is a mental image that summarizes a set of similar observations, feelings or ideas. Concepts are general codifications of experience and observations. A term such as poverty and social status is a summary notation for a phenomenon, and a concept is what we mean by a term. Concepts frequently have more than one meaning or definition. Personality, for example, is defined in dozens of ways. Bureaucracy and many other social science concepts also have multiple meanings. Therefore, when concepts are used, researchers have to define concepts and show how they are being used in a particular research setting. **Conceptualization**: is the process of specifying what we mean by a term.

Operationalization

Concepts cannot be observed directly. As we said, they are abstractions that exist only as mental images of things we want to talk about. To do research, we have to convert concepts to

things we can observe. We do this by defining concepts in terms of measurable *variables*. How can you tell whether a worker has a "low" or "high" self esteem? One way might be to simply ask a worker "do you feel positively or negatively about yourself?" and record 'Positive' or 'negative' or 'no answer' according to the responses. Alternatively, you could ask a person: "please rate yourself from 1 to 10 in terms of how you feel about yourself. '1' is feeling very negatively about you and '10' is feeling very positively about yourself." The result would be a number from 1 to 10 (or no 'response'). These specific procedures to measure a concept are called operational definitions; operations by which measurements of the variable are actually carried out.

An illustration

Let's move from the abstract description of the process of conceptualization and operationalization to a concrete example. Measures for a concept or any of its dimensions may be based on a single indicator or on a set of indicators. Also, more than one indicator can be used for measuring a variable or one of its dimensions. The following illustration shows use of single and multiple indicators.

Suppose we asked: "What is the relationship between the social status of men and their attitudes toward gender equality?" We start with two abstract concepts - *social status* and *attitudes* toward male-female equality. Our next step would be to define each concept so readers of our report will know what we mean when we use each concept.

Conceptualizing social status

Starting with *social status*, we could use an accepted definition or create one that we think is better suited for our study. Social status is generally understood to refer to a person's position, from high to low, in terms of rank in relation to others within their community. But this definition contains several aspects or dimensions of status in relation to one's neighbors. Do we want to refer to some form of achievement, such as their levels of schooling or the kind of work the men do? Would the socially accorded status of the men's extended families be a better measure of their social status? Or, should we think in terms of the power the individual or his family has in the community? Each of these and perhaps other dimensions might be used.

In deciding how to conceptualize social status, we would certainly review the literature on how social status has been defined and measured in studies similar to the one we are planning. In reviewing dimensions to measure, we would also consider how practical it would be to collect data for any dimension we are considering. Of the dimensions mentioned above, getting data on the men's levels of schooling or their occupations would be easier than trying to measure how extended families are ranked or how members of the community view the power of various families. Practical considerations in obtaining data frequently decide which dimensions are selected and how they are measured.

In our case, we decide to focus on social status as unique to each man and one not dependent on the views given to his extended family or the power of the family in the community. The process of conceptualizing social status is shown on the left side of **Figure 6.1.**

Conceptualizing attitudes toward gender equality

Identifying dimensions for the concept of male/female equality is a more complex task. No matter how we define this concept, we would find that it embraces a number of dimensions.

The question of how many or which dimensions to measure, illustrates again how practical considerations enter into research design and the selection of indicators. We have to decide whether the research question we are investigating requires measurement of all possible dimensions or whether selection of just a few dimensions would be sufficient for our purposes. For many investigations, a few well chosen dimensions and their indicators are enough to demonstrate any association the investigator is seeking. We could, therefore, select only a few dimensions of male/female equality for the purposes of our study. The choice is ours, but we would have to provide a reason for choosing whatever dimensions we decided to measure. Let's say we decided to limit measurement to attitudes with regard to equality in the right of women to schooling, in marriage relationships, and to work outside the house, because we think these are the most critical ones. The right side of **Figure 6.1** shows the results of conceptualization for the concept of attitudes toward male/female equity.

Operationalizing concepts

Following conceptualization, our next step is to select indicators or variables for each of the dimensions of concepts we choose to measure. As shown in **Figure 6.1**, we decided to use two indicators for measuring our selected dimension of social status; namely, *years of schooling* and the status of the occupations of the respondents. Each is widely recognized as an indicator of social status. Operationally, we defined each by a single item on a questionnaire; one item asked how many years of schooling each respondent had completed; the other asked for his main occupation.

For the dimensions of gender equality in schooling and in work roles, we also decided to use only one indicator, operationalized as a single questionnaire item. Two indicators were selected for measuring equality in marriage, one based on observation of how much equality is reflected in the everyday interaction between husbands and wives, and the other based on responses to a set of questions asking for the men's views on how much equality there should be between husbands and wives in various daily activities, such as raising children, deciding what to buy, who to visit, etc.

Establishing relationships

The six indicators would become the measures used in the investigation of the relationship between men's social status and their attitudes toward male/female equity. Responses to the indicators become the data for the study. These data would be analyzed to establish the degree

of association between each indicator of social status with each indicator of attitudes. With two indicators for social status and four for measuring different dimensions of attitudes toward female equity, the analysis would involve eight relationships, as shown in **table 6.1.**

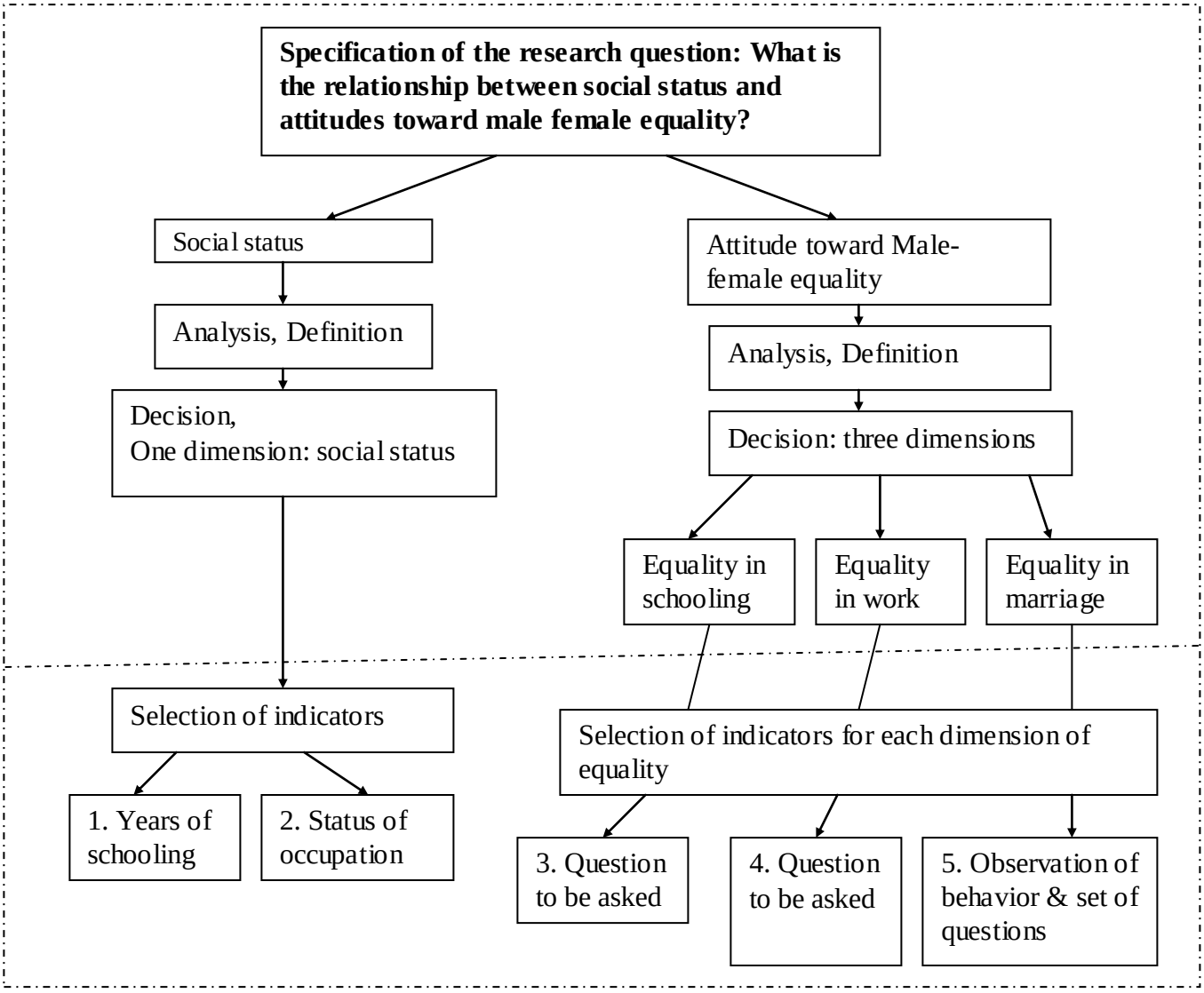


Figure 6.1 Conceptualization and operationalization

Assessing dimensions and indicators

In selecting indicators, we could use items that had been used in other similar studies elsewhere. While most indicators developed for research in other cases may also be appropriate for similar studies, some may not. If the dimensions and indicators for a concept are not relevant in local terms, any resulting data will be meaningless. Also, although a concept may be equally valid across a wide range of cultures, the operations used to measure it in one cultural setting may be quite different from those used somewhere else. Social status,

a frequently used concept, is a good example. Results from many studies shows that social differences exist in virtually all societies. The bases used to assign social rank to persons in any society, however, vary greatly from one society to another. Any operational definition used for this concept should be appropriate in terms of definitions of social status in the cultural setting of an investigation. If you aren't sure what indicators to use for measuring a variable, in this case, social status, conduct an exploratory study to find out how individuals are ranked in the cultural setting of your investigation.

Table 6.1. Illustrative tests for empirical relationships between two sets of indicators

Indicators of social status	**Relationship with**
Years of schooling of husband	Responses to an item about equality in schooling
	Responses to an item about equality in marriage
	Observation of equality on husband and wife interactions
	Responses to a set of items about equality in marriage
Occupation of husband	Responses to an item about equality in schooling
	Responses to an item about equality in marriage
	Observation of equality on husband and wife interactions
	Responses to a set of items about equality in marriage

In our example, we used two indicators for social status and four for measuring attitudes toward male-female equality. Analysis of data for these indicators would provide independent tests for relations between each operational definition of social status and each operational definition of attitudes toward female equality, as shown in **table 6.1.** These data would provide a much stronger basis for establishing a relationship between the concepts of social status and attitudes toward male/female equality than would just a single test based on one indicator for each concept. In selecting indicators and in developing operational definitions of them, we also have to consider the *level of measurement* each indicator provides.

6.3 Levels of Measurement

Any adequately specified measurement procedure must have a category into which each and every case can be classified. Adequately defined variables are generally classified into the following four levels of measurement.

1) Nominal Measurement
2) Ordinal Measurement
3) Interval Measurement
4) Ratio Measurement

The characteristics of each level of measurement are shown in **Figure 6.2**. The figure can also help you decide correctly what level is represented by any set of data you may have to analyze

Nominal measurement

In deciding about the level of measurement represented by some set of data, first ask: Are the data in the form of words or are they represented by numbers? Data recorded in words, such as descriptions of actions, are considered as qualitative: Data in the form of numbers represent quantitative measurement. Qualitative data may be either in nominal or ordinal form. To separate the two, one needs to ask a second question: Can the data be ordered on some criteria? If the answer is "no," the data were measured at the nominal level. Nominal measurement is shown at the left in **Figure 6.2.** Nominal variables are those that are properly defined with logically exhaustive and mutually exclusive categories, so that equivalences or differences are clearly established. The categories are simply logically different or distinct from each other. Such nominal variables in sociology include marital status, gender, religious affiliation, party membership, occupation, ethnicity, etc.

For nominal variables the categories are simply different, whether or not they are labeled with numbers. With nominal scale, each score does not actually indicate an amount; rather, it is used for identification. License plate numbers and the numbers on football uniforms reflect a nominal scale. The key here is that nominal scores indicate only that one individual is qualitatively different from another. So in research nominal scales classify or categorize individuals. Because we assign numbers arbitrarily, they do not have the mathematical properties that numbers normally have

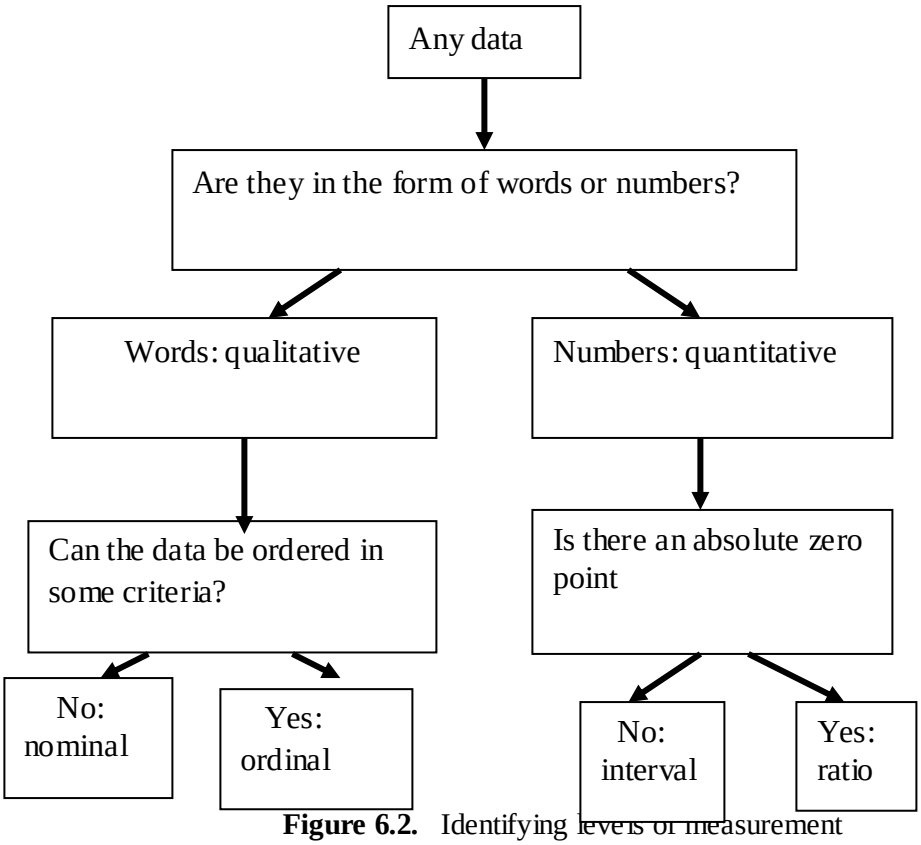


Figure 6.2. Identifying levels of measurement

Ordinal measurement

If the data are qualitative but the categories making up the variable can be ordered according to some criteria, the data are measured at the ordinal level. For example, suppose you asked respondents to indicate the level of schooling they had completed, using categories such as "none," "primary," "intermediate," and "secondary or higher." These levels represent ordinal measurement because respondents can be placed in some kind of rank order, from low to high.

Responses for many questionnaire items are obtained at the ordinal level. Respondents, for instance, may be asked whether they "strongly agree," "agree," are "uncertain," "disagree" or "strongly disagree" with some statement. Clearly, there is an order in these categories from strong positive to strong negative views. In ordinal measurement, each category can be compared to the others in relative terms. Differences can be expressed in terms of "more" or "less," which, though still limited, is an improvement over nominal measurement.

The values assigned to the categories of an ordinal scale may be expressed either in words or in numbers. For example, the prestige rankings of universities might be expressed as numbers

(1st, 2nd, 3rd, etc.). Note, however, that these numbers are ordinal rather than cardinal. The usual arithmetic operations of addition, subtraction, multiplication and division are not permissible with ordinal numbers. It makes no sense whatsoever to add two numbers such as 1st and 3rd. Consequently; ordinal level measurement does not lend itself to computations that require the use of arithmetic. It is permissible, however, to count the number of observations that fall into each category of the scale.

Interval measurement

Interval measurements indicate an actual quantity, and an equal amount separates any adjacent scores. However, although interval scales do include the number zero, it is not a true zero. It does not mean none of the variable is present. Therefore, the key here is that you can have less than zero, so an interval scale allows negative numbers. For example, temperature (in Celsius or Fahrenheit) involves an interval scale. Because 0^{o} does not mean that zero heat is present. Notice that with an interval scale, it is incorrect to make 'ratio' statements that compare on score with another score. For example, at first glance it seems that 4^{o}c is twice as hot as 2^{o}c. However, if we measure the same physical temperature using the Fahrenheit scale, we would have about 35^{o} and 39^{o} respectively. Now one temperature is not twice that of the other.

The intelligence or IQ test is probably one of the best known interval scale of measurement. When psychologists developed intelligence tests, they fixed the normal or average intelligence at 100 with scores below 100 indicating progressively less intelligence and those above 100 indicating progressively more intelligence. Here, it can not be interpreted that a person with a score of 120 is twice as intelligent as a person with a score of 60. The reason is that intelligence is not based on an absolute measure of zero intelligence. We can only say that the person with the higher score measured 60 points higher than the other person in terms of the way intelligence was measured.

But this statement is a further advance in providing information over that obtained with ordinal measurement. With interval measurement, a number can be used to describe differences, but the difference has to be described in terms of the intervals or numbers used in the measurement. Many measurements in the social sciences are at the interval level. Measurement of attitudes, values, preferences, prestige, and various abilities, for example, are frequently measured at the interval level.

Ratio measurement

In addition to the features of interval measurement, ratio measurement is based on the unique feature of starting from an absolute zero point. Many indicators we use have an absolute zero point. Examples include the size of any population, age, years of schooling; amount of money, and the frequency of events. Here, the scores measure the actual amount, there is an equal unit of measurement, and zero truly means that none of the variable is present. The key here is that you can not have negative numbers, because you can not have less than nothing. For many such variables, we can compare the size of any measurement with some other

measurement of the same variable and say how much they differ in absolute terms, such as one is twice or four times larger than the other. A student, for example, may be 20 years old and his or her father may be 40 years old. We can accurately say that the father is twice as old as the student. In this instance, we calculated the ratio of the ages (40 divided by 20) and came up with a ratio of two. This is possible because we started with an absolute zero for measuring age.

If it is possible to define a variable as a ratio variable, then it is also possible to talk about ratios (e.g., two years of education is half of four years education, and this ratio is the same as the ratio of 12 years to 24 years). These statements would not be possible if one could not count units (years) from a meaningful zero starting point.

Table 6.2 Properties of different levels of measurement

Level of measurement	Defined characteristics of category systems			
	Exhaustive mutually exclusive categories	Categories defined to have an ordering	Defined standard unit of measurement	Meaningful zero point on the scale
nominal	yes	No	No	No
ordinal	yes	yes	No	No
interval	yes	yes	yes	No
ratio	yes	yes	yes	yes

Main points

1. Measurement is based on the inter-related processes of conceptualization and operationalization. Conceptualization is the process of defining concepts and specifying and defining any selected components or dimensions of concepts. Operationalization is the process of developing measurements for concepts or their dimensions.
2. Indicators are variables used to measure concepts or their dimensions. An indicator must have two or more attributes.
3. All indicators should be carefully analyzed to be sure they are appropriate in the cultural setting in which they will be used.
4. When possible, it is a good idea to use two or more indicators for measuring any concept or dimension.
5. There are four levels of measurement: nominal measurement indicates only that attributes differ in some way, as males vs. females; ordinal measurement indicates some order or ranking of attributes (high, middle and low social status, for example); interval measurement is based on numbers, but without an absolute zero point (temperature, intelligence); and ratio measurement is also numeric, but with a real or absolute zero point (age, size of a population).
6. Always use the highest level of measurement possible for any indicator. This will permit more powerful analyses of the resulting data.
7. A valid indicator measures the intended concept and not something else.

Review questions

1. What is measurement? Discuss the steps involved
2. Describe the four levels of measurement and explain the characteristics of all.
3. Describe ethical values that should be observed in research.
4. Measure the concept 'love' as an ordinal variable.
5. define and discuss the following key terms
    - Anonymity
    - Confidentiality
    - Indicator
    - Dimension

Chapter 7 - Sampling Methods

7.1 Introduction

The purpose of most research is to learn something about some large group called the *population*. One way to learn something about a population is to collect data from all the members of the population. This is known as taking a *census* or *enumerating* the population. Generally, because of the time and cost involved, it is impractical to enumerate a population. The only practical alternative is to obtain data from a part of the population, called a *sample*.

Enumeration versus sampling

Enumeration has one great advantage over sampling. For smaller populations, enumeration produces accurate descriptions of variables. If you collected data on absence from work for all workers in a government ministry for a certain period of time and every worker gave valid, accurate responses, the results would accurately describe absenteeism for that population of workers. However, if you used a sample, even with valid and reliable responses, the results for absenteeism would describe the rate of absence for the part of the population from whom you obtained data. Another sample would produce a different rate of absenteeism because every sample contains a certain error based on the variations that occur from one sample to the next. With this apparent disadvantage, why is most social research based on samples?

Why sample?

The main reason for sampling is that many populations are simply too large to enumerate. Collecting data from a population of thousands or millions requires a huge planning effort and a large staff of interviewers, supervisors, and data processing personnel. Months or even years would be required and would be expensive. With a sample, data can be obtained in a short period of time and at a reasonable cost. All the planning and administrative requirements are greatly reduced as well.

Similar practical considerations will probably determine whether you enumerate or use a sample. If the population you are studying is rather small and you can collect data from all its members relatively easily, by all means do so. Then, you will not have to deal with the problem of sampling error. However, if your population is too large to enumerate, you will have to use a sample.

Sampling is not limited to selection of individuals to become respondents in a survey. Sampling can be used to select organizations, villages, other geographical or political entities, the content of newspapers for analysis, or time periods for observing certain behaviors. In fact, sampling can be applied to almost any unit of analysis you might think of.

7.2 Probability and Nonprobability Sampling

Probability sampling methods rely only on *random* or *chance* selection. Only a carefully selected probability sample allows a researcher to generalize from sample results to the population from which the sample was selected. Each method is based on chance and chance alone. No other consideration is allowed to affect who is included in the sample. Human choice or judgment is specifically ruled out. Once the chance process is started, the researcher accepts the resulting sample and makes no adjustments or other changes to make it come out any differently.

In contrast, *nonprobability* samples are selected by means other than chance, typically on some from of human choice or judgment. Respondents, for example, might be selected because they were friends or relatives or lived in easily accessible places. Any nonprobability sample has a serious limitation. There is no way to show that a nonprobability sample represents any population. This means that results from nonprobability samples cannot be safely generalized beyond the particular collection of persons from whom the data were collected.

Use of probability samples avoids this limitation. By using chance, we eliminate any possible bias in the selection of respondents. When proper procedures are used, probability sampling gives the best assurance that the resulting sample represents the population from which it was selected.

7.3 Probability Sampling

Sampling terms

Shortly, we will describe the four main methods of selecting probability samples. To understand and apply these methods, you first need to understand certain concepts and terms used in sampling.

Population: Your research question defines the group or population you want to learn about. Many small populations can be defined precisely. All students who graduated last year from your university would form a concrete, easily defined population. So would all staff of a certain business or all heads of households in a village. Many populations we choose to study, however, are harder to define with any accuracy. The population of a city, for example, exists only as an abstract concept. We may have an estimate of the population size, but at any moment the population changes: Some persons and families leave, others arrive. The same is true for many organizations and other groups we want to study. Because of constant changes in populations, researchers have to define a population as clearly as possible in concrete terms before preparing to select a sample. This is generally done by placing specific geographic, time, membership, or other limits on the abstract population. The specifically defined population is referred to as the *target population*. The target population is the population we want our sample to represent. **Box 9.1 il**lustrates some target populations.

Notice that each definition creates a concrete, measurable population. The population for Gondar for example, is limited to persons who have lived in a household for the past six months and were present during the month of March, 2008. This definition rules out persons who live in hotels or who are temporary guests living in Gondar. The second example includes only full time staff of ministries with at least 500 employees and who were employed as of June 1, 2008. Each of the other populations has specific limits.

Box 7.1. Illustrative target populations

1. All persons who have lived throughout the past six months in households in the city of Gondar, and were present during the month of March, 2008.
2. All government ministries in Ethiopia with 500 or more full time staff, as reported on June 1, 2008.
3. All patients admitted to government hospitals with at least 25 beds in Addis Ababa during the month of February, 2008.
4. All editorials published on the editorial pages of the Ethiopian Herald from September 12 through December 31, 2008.
5. All households headed by women who lived full time in the Somalia camps for internally displaced persons during the week of May 23, 2007.

Sampling element: A *sampling element* or *sampling unit* is a single member or unit of the target population. This is the unit about which information will be obtained. Frequently, the sampling element is an individual, but as illustrated in **Box 7.1,** sampling elements may be organizations, editorials, or groups, such as households.

Sample frame. This is the list of all sampling elements from which the sample is selected. The *sample frame* is the practical, operational definition of the target population. Ideally, we begin by defining the target population for a given study and then search for a sampling frame that matches the target population as we have defined it. In practice, however, the process is often reversed. We sometimes begin with a general definition of the population and using this as a guide, search for sampling frames until we find one that comes close to the definition of the target population and then use it. Finding an accurate, up-to-date sample frame is crucial to good sampling. Unfortunately, valid sample frames are difficult to find in many developing countries. Lack of a valid sample frame is a major source of error in sampling.

Statistic: A *statistic* is a finding based on a sample. Statistics are generally reported as percentages, averages, and measures of variation among scores.

Parameter: A *parameter* is a result based on enumeration of a population. Because enumeration is seldom undertaken, parameters generally are not known. Instead, parameters are estimated using inferential statistics.

Sample design: This is the plan prepared in advance for selecting a sample, using a probability or nonprobability method. A properly described *sample design* includes:

- A precise definition of target population;
- Definition of the sampling element (defined a bit later);
- Description of the sampling frame used (also defined later);
- Description of the method of sample selection;
- The planned size of the sample;
- The time period during which data were obtained; and
- The size and composition of the actual sample that was obtained.

Sampling error: is the difference, due to random chance, between a sample statistic and the population parameter it represents**.** It helps to judge how well a statistic for a given sample provides an estimate of the corresponding parameter.

With this background, we now turn to four ways for selecting probability samples. These are:

- Simple random sampling;
- Systematic random sampling;
- Stratified random sample and;
- Cluster or multiple stage sampling.

Each has its specific uses. We begin with the basic and simplest of these — the simple random sample.

Simple random sampling

An illustration should help you grasp the concept of a *simple random sample*. Imagine we wanted a probability sample of 100 faculty members out of a population of 500. One way to get the sample would be to write the name of each faculty member on a slip of paper, put the slips in a box, shake the box until the slips are thoroughly mixed, and then reach in and draw out a slip of paper. This would result in the random or chance selection of the first faculty member of our sample of 100. The selected name would be written down and that person would become a member of the sample. This process would be repeated 99 times. Each time a slip of paper is drawn, all the remaining pieces or names have had an equal chance of being selected. This is the basis of a simple random sample.

Selecting

Steps in selecting a simple random sample are:

1. Define the target population and sampling element;
2. Select a sampling frame; and
3. Select the sample.

Define the target population and sampling element. Definitions for the target population and the *sampling element* are generally made together. Definition of one pretty well defines the other. With the sampling element defined, the target population becomes the aggregation of all elements or units with the characteristics defined for the sampling element. Starting the other way, a clear, specific definition of the target population also defines the elements comprising this population. Either way, however, we would need a sampling frame.

Select a sampling frame. This is a crucial step in developing a simple random sample design. Any potential *sample frame* you plan to use should be carefully examined to determine to what extent it matches the target population.

Returning to the faculty example, we would need to obtain a list of the members of the faculty. This should be easy to get, but, even with the list, we still have to define our target population. Should we include only full time staff or should part time faculty be included as well? What about administrative and support staff: Should they be included or are we limiting the target population to teaching staff only? Do we include visiting faculty from other universities? Answers to these and other questions will depend on the purpose of our research. If our purpose is to investigate teaching experience, we obviously would limit the target population to only teaching faculty and exclude administrative and support staff. If we were investigating morale of all university staff members, teaching and administrative staff as well, we would want to include all staff.

Regardless of how the target population is defined, any faculty list would be checked to make sure it corresponds to the target population as we defined it. We would want to make sure that the list is up to date, that names of all eligible members are included, that no names are listed more than once, and that no other errors occurred. Any of these errors could invalidate the sample.

Finding a suitable, valid sampling frame is frequently difficult. In many developing countries, there is limited census data to draw on. Further, with civil unrest, wars, drought, and other problems, large population changes frequently occur, making previous census data inaccurate. It is always a good idea, therefore, to carefully check the accuracy of any sampling frame you intend to use. Lists of residents in a village, for example, can be checked for accuracy with village elders. Names of dead persons or those who have moved away can be removed and names of new residents can be added. With these changes, a local list of residents could become a suitable sampling frame for designing a simple random sample of households in a village. Similar checking can be used to convert a questionable list of employees of a factory or other organization into a useable sampling frame. When a trustworthy sampling frame cannot be found or created, other forms of sampling should be considered.

Select the sample. Once you are satisfied that the sampling frame represents the target population reasonably well, you can select your sample. You can use the "box" procedure mentioned above. Or, Instead of writing the names on slips of paper, putting them in a box, and drawing out names, you could use a table of random numbers. Your social statistics instructor probably has a statistics book with a table of random numbers and he/she could assist you how to use such tables

Systematic random sampling

Systematic or *interval sampling*, as it is sometimes called, is based on random sampling, but often is easier to complete than simple random sampling. As with all random sampling, the investigator must define the target population, find or create a suitable sampling frame, and number each element in the frame. Instead of drawing each element at random, the investigator calculates a *sampling interval* and uses this interval in selecting elements to be included in the sample.

We can use our faculty illustration to show how a systemic sample, is selected. Calculation of the interval is based on the ratio of the sample size to the size of the target population. Using the faculty illustration, we want a sample of 100 faculty members from a target population of 500. The ratio then becomes 100/500 or 1 in 5. To get a sample of 100, we will need to establish an interval of 5. Then, selecting 1 name out of every 5 names in the sample frame will give us a sample of 100 names. Using a faculty list as the sampling frame, we select every fifth name. But, we have to do this in a random way. To create a random systematic sample, we:

1. **Number each element (name) on the sampling frame**. In our example, the names, as before, would be numbered from 1 to 500.

2. **Establish the sampling interval that is needed**. As already explained, we will use an interval of 5.

3. **Use the box method or a table of random numbers to select a random start point**. In this case, we are looking for a number between 1 and 5. Using the procedures defined previously, we would select a starting point. Let's say the number chosen was 4. Sample element 4 would therefore become the first member of the sample.

4. **Select elements from the sampling frame that occur at the stated interval.** Starting with the fourth name on the list, we would select every fifth name. Thus, the sample would consist of names represented by numbers 4, 9, 14, 19, etc., up to 499 on the list of faculty members. The resulting 100 numbers and corresponding names is a systematic random sample.

Caution in using systematic samples

Systematic sampling can introduce a special kind of bias. To illustrate how this could happen, suppose you were studying the levels of job satisfaction among staff of a government

ministry. Since the ministry has a complete list of all staff, you decide to use systematic sampling. Also, you decide to use a sampling interval of 20. Now, suppose that the first name you selected was a supervisor and that a supervisor's name appeared as every 20th name thereafter. If this were the case, you would have selected a supervisor for the first sample member. Then, by using the interval of 20 you would have selected only supervisors for the rest of the sample. Thus, the entire sample would be made up of supervisors. The problem with this is that a sample based on supervisors only would not be representative of the population of all staff of the ministry. With their higher positions, supervisors have greater responsibilities, are better paid, and have more privileges. Consequently, their job satisfaction levels certainly would be different from the rest of the other staff. Obviously, any results based on responses of only supervisors would be biased and could not be used to describe the morale of the staff in the ministry.

This kind of problem can occur in using an interval sample in any formal organization, such as a government ministry, university, or military unit. When you plan to use a systematic sample, check to see if the names on the sampling frame are arranged in any systematic order. If some kind of order exists, then a simple random sample should be used or another method, called a stratified sample, which we describe next, should be used.

Stratified random sampling

A properly drawn simple random sample or a systematic random sample is a trustworthy way to select a sample, but for some investigations a *stratified random sample* is more appropriate. A stratified random sample can be easily understood by defining its two key terms — stratified and random. You already know that random means selection by chance. Stratified simply refers to selection within subgroups that make up some population. The student population of a university, for example, can be stratified in several ways — by gender, into males and females; by class level, into first, second, third and fourth years; by the college in which they are enrolled; or by undergraduate versus graduate levels. Most populations can be stratified in one or more ways.

Selecting

In selecting a stratified random sample, the same steps are followed as with a simple random sample, except that an independent sample is selected from each of the stratum of the population. The specific steps are:

1. **Define the target population and strata to be used**. As with all sampling, it is necessary to clearly define the target population and sampling element. In addition, for a stratified random sample, each stratum to be sampled has to be defined. Definition of strata is a matter of choice and depends on the nature of the problem being investigated. A suitable sampling frame must be available for each stratum.
2. **Obtain or develop a suitable sampling frame for each stratum.** As described for a systematic sample, care must be taken to avoid conditions that could bias sample selection.

3. **Decide on the sampling rate to be used for each stratum**. With stratified sampling, different rates can be used for each stratum. The value of this feature will become clear shortly.
4. **Select a simple random or systematic sample within each stratum.** Either a simple random or a systemic sampling method can be used.

Strengths and limitations

A great advantage of stratified sampling is that different rates can be used for sampling different strata. To illustrate, imagine you were studying differences on some issue between male and female students in a university with 2,500 male and 500 female students. And suppose you wanted a sample of 300 students or 10% of this population. If you used a simple or systematic sample you would get approximately 250 males and 50 females, save a certain variation due to chance that might occur with every sample. But do you need 250 males to get enough data and would having data from only 50 females be enough? Why make a comparison based on 250 versus 50? Would it not be more sensible to base the comparison on an equal number of males and females?

Yes, it would; and this illustrates the great feature of stratified sampling. Instead of selecting 10% of all the students, you could select separate samples of males and females of equal size. Let's say you decide that the comparisons should be based on 100 students in each stratum (male versus female). To get 100 males you would select 100 out of the 2,500 males or a sample of about 4% while for females the sampling rate would be 100 out of 500 or about 20%. Although different rates were used, each sample would be a legitimate sample for its strata. Results from each stratum could be used to describe characteristics of males versus females, provided, of course, that proper procedures were followed in selecting each of the samples. In addition, results from the samples could be safely generalized to the population represented by each stratum; from the sample of males to the population of males, and the same for the females.

Stratified sampling, however, has some drawbacks. First, to use it properly you have to know the proportion of each stratum in the population. In our example, we did, but often in many cases the proportions for strata are not known. Some strata, therefore, may not be properly represented in the final sample. Also, use of different sampling rates for various strata requires an adjustment called weighting when data from the strata are combined to describe some variable for the population as a whole. A simple example of weighting is described later in this chapter. Weighting procedures, however, can become complicated. Simple random or systematic random sampling does not have these disadvantages. Either method generally is safer to use when the proportions of the strata of some population are not known.

Cluster sampling

Each of the three sampling methods described so far requires use of a sampling frame. These methods also work best when the population is in some thousands or smaller, and when the population is reasonably accessible or concentrated in small areas. But what can be done

when there is no sampling frame or when the population is very large and scattered over a wide area? Then, the methods described previously are impractical. To get around this problem, researchers have developed another sampling method, called the *cluster, multistage* or *area* sampling.

The idea behind this method is quite simple. Instead of selecting the ultimate sampling elements (usually households or individuals) right off, a several-step process is used. First, the investigator defines a set of large clusters that together cover the target population. Clusters often are geographic areas, such as villages, regions of a rural area, sections of a town or city, or physical units such as schools or hospitals. Each cluster defines some part of the target population. Depending on the size of the ultimate sample wanted, some number of these clusters is selected at random.

Each of these first order clusters is subdivided into small clusters and some number of these secondary clusters is randomly selected. Generally, only first and second order clusters are used. In rare circumstances, a third set of clusters might be needed. These choices depend on how large a sample is wanted and how widely the population is spread over an area. With a larger sample and greater population dispersion, more clusters might be required. Using a simple random or systematic method a random selection of sampling elements from the last set of clusters completes the process.

Selecting

A map of the area to be sampled is usually necessary for designing a cluster sample. If available, aerial maps provide a good basis for creating clusters. Lacking any map, investigators often draw their own maps, based on driving and walking around the areas where clusters are to be defined. If the purpose were to design a sample of households in a certain section of a city, the area could be inspected and houses noted on a map, which could then be used in selecting clusters. This approach, however, will work only for relatively small areas. For large areas, such as provinces or large cities, maps are essential.

Cluster sampling requires making decisions about the number and sizes of clusters to use at each stage of sampling. A good way to start is to decide on the size of the final sample. Suppose that you think you have enough time to interview 150 persons in a city of approximately 15,000 persons. To get this sample, you will need to make three decisions:

- How many primary clusters to select;
- How many secondary clusters to select within each primary cluster; and
- How many households to select randomly within each secondary cluster.

The answers to these questions depend on two conditions. One is the arithmetic involved. Obviously, the final number of 150 is going to be a product of the number of primary and secondary clusters chosen and the number of households selected within each secondary cluster. In any real situation, many combinations of these numbers will produce the desired number for the final sample. Fortunately, several guidelines help in making these decisions.

First, select as many clusters at each level - primary, secondary, and, if used, tertiary (third level down) as your resources will allow. We will make this point clear shortly. This will spread the sample over the largest possible area. The reason behind this rule is simple: As smaller areas are selected, populations generally become more similar. Households or whatever is being sampled in the last set of clusters generally will be more alike and differ somewhat from households in more distant clusters. To ensure that the final sample best represents the population from which it was selected, we want to get as much variation or heterogeneity as possible. Therefore, it is advisable to spread the sample as widely as possible at the beginning, by selecting as many primary clusters as possible and minimizing the number of sampling units selected in the final clusters.

Practical considerations, however, often limit application of the guidelines just described. The intended effect of these guidelines is to spread the sample as widely as possible over the area representing the population. While increasing the chances of getting a representative sample, the wider spread also increases the time, effort, and cost required to conduct the interviews. Selection of a smaller number of primary clusters concentrates interviewing in a smaller number of areas, making it easier to complete the required fieldwork. This approach increases the possibility that the final sample will be less representative of the population being studied. In practice, researchers balance these two competing conditions. To the extent practical, larger numbers of primary and secondary clusters and fewer ultimate sampling units are used.

A final word: anytime you cannot find a suitable sampling frame, consider using a cluster sample. Some form of clustering, whether in terms of geographical areas or institutions, is almost always possible. Different sampling techniques can be creatively combined to meet the requirements of an investigation.

Weighted samples

Probability sampling is based on the fact that each sampling element has an equal chance of being selected. In our example of stratified random sampling, however, females had a much great chance of being selected than males. Disproportionate sampling of females versus males raises no problems as long as the data from each of the samples are used to generate estimates of the parameters for the corresponding population. Results from each of the samples could also be used in comparisons between the two groups. We could do either of these things because each sample was a valid probability sample of the sub-population of males and females.

The separate data for each sample, however, cannot be combined as they stand to generalize to the entire student population. While we had probability samples for each sub-population based on gender, we did not have a valid probability sample for the entire student body population: Females had a much greater chance of being selected than males. There is a way, however, to correct for the disproportionate selection of females. The sample has to be corrected to reflect the greater representation of females relative to males. Here is one way this can be done.

In our illustration, the chance of selecting a man was one-fifth that for selecting a women. If we wish to combine data for both samples to form one sample to represent the entire student population, we have to correct this imbalance. Since we know males are under represented by a factor of 5, we could give any data for males a weight of 5 compared to data for females. Accordingly, any measurement for males would be multiplied by 5, while those for females would be left as obtained. As an alternative, we could weight the statistics, such as mean, for the male sample before combining it with the mean for the female sample. A mean for the male sample would be multiplied by 5 and then added to the mean for the female sample, after which the sum would be divided by 6, the number of means involved in the summation. For example, suppose the mean for some variable for the male sample was 20 and that female sample was 17. The mean for the total sample would be 20 times 5 for the male sample plus 17 for the female sample, giving a weighted mean of 100 plus 17 or 117 divided by 6 or 19.5 for the entire sample.

Weighting can become complicated and involve some difficult calculations. This is particularly true when area sampling is used. When the clusters at any stage contain different numbers of units (households, etc.), weighting is necessary to correct for the disproportionate selection of various clusters. This problem can be avoided by creating clusters with approximately the same numbers in each before selecting the clusters at any stage in the process. When this is done, the sample becomes *self weighted*. Then, data from the final clusters can be safely combined to make estimates of characteristics of the population.

7.4 Problems to Watch for in Sampling

In selecting a probability sample, researchers strive to avoid or at least minimize problems that can bias the sample. Three kinds of problems often occur:

The target population is not clearly defined. This error occurs most often when the population is left at a general or abstract level instead of being defined in concrete, operational terms. An error like this led to an international issue in February, 2002, involving high government officials in Kuwait and the United States. An American reporter wrote a story based on surveys in Kuwait and eight other Muslim countries. The Gallup Poll, a highly respected survey organization, conducted the surveys. The results showed that 36% of the Kuwaiti respondents said the attacks on the World Trade Centers in New York City on September 11, 2001, were morally justified. This was the highest percent found in any of the countries included in the survey. Further, only 17% of the Kuwaiti respondents approved of the activities of the United States in Afghanistan. Americans were outraged that the citizens of Kuwait, who United States had rescued in the Gulf War, had such negative attitudes toward the American government. The Kuwaiti ambassador to the United States, however, correctly pointed out that the responses did not represent the views of Kuwaiti citizens.

The Gallup Poll, the organization that conducted the surveys, had selected a sample of persons who lived in Kuwait and not a sample of Kuwaiti citizens. Workers from other countries make up 60% of the population of Kuwait, with many drawn from Pakistan, Egypt, and other Arab countries. The Gallup organization failed to distinguish between Kuwaiti

citizens and persons who lived in Kuwait. They did not define the target population and limit their sampling to Kuwaiti citizens. The lesson of this episode is clear: Base your sample on a clearly defined target population and make sure this is the population you want to describe something about.

Poor sample frame. Bias at this step can be eliminated by making sure the frame is up-to-date, complete, does not contain duplications, and in all other ways matches the target population or comes reasonably close to doing so.

Mistakes are made in sample selection. Mistakes can occur, even when one is careful. Errors can occur in numbering elements, in using a table of random numbers, in copying the numbers selected, and in other ways. The only way to avoid such errors is to check and double check each step in sampling and to correct each error that is found.

Low response rate. This problem arises because data are not obtained from some of the persons or other units selected as members of the sample. Some sample members cannot be located, some are never at home when an interviewer tries to contact them, and some refuse to be interviewed. Whatever the reason, the actual number of persons interviewed generally is less than the number selected to form the sample. As the *response rate* declines, the resulting sample becomes less representative of the target population. This reduces the value of the results for generalizing to that population.

7.5 Nonprobability Sampling

Although we earlier advised using only probability sampling, sometimes nonprobability methods may be warranted. If the purpose of the research is to explore some topic, for example, to identify key concepts or to test respondents' understanding of items to be used in a scale, nonprobability methods are appropriate. In such cases, the purpose is not to generalize, which requires a random sample, but to learn something for later use. Also, when a sampling frame does not exist and cluster sampling is impractical, nonprobability methods are the only way to obtain a sample.

If any of these conditions apply, you may want to consider using some variation of the following nonprobability samples. But remember, lacking random selection of the sampling elements, nonprobability samples have two serious limitations:

- There is no control or protection against bias introduced by the investigator in the selection of the sample, whether this is by conscious or unconscious action.
- Since the variation that inevitably occurs in sampling cannot be estimated, results from a nonprobability sample cannot be safely generalized beyond the specific sample that was used.

Still, there are occasions, when nonprobability sampling methods may have to be used. Four frequently used nonprobability sampling methods are:

- Convenience sampling;
- Quota sampling;
- Purposive sampling; and
- Network sampling.

Convenience samples

In *convenience* sampling, also called *haphazard* sampling, the investigator selects some number of persons or other sampling units because they are easily accessible. Some illustrations of convenience samples are shown in **Box 9.2.**

Box 7.2. Illustrations of convenience samples

1. Students found on the street near your university
2. Persons selected by the investigator from those in a market on Monday morning
3. The first 20 persons encountered at a bus stop
4. Persons who respond to an invitation to comment on a television show
5. All the mothers at the local well baby clinic on a Thursday morning

Students frequently confuse convenience sampling with random sampling. As we have stressed repeatedly, random selection is based on a conscious, deliberate plan that removes any choice on the part of the investigator. In contrast, a convenience sample is based on whatever criteria the investigator happens to use. On the positive side, convenience sampling is quick, easy, and inexpensive. It may be appropriate for exploratory research or for testing scales, for example, but never for developing estimates of parameters.

Quota samples

A quota is a share or an allocation of something. Some universities, for example, have quotas for the number of students from various parts of the country. Students from each region are accepted until a certain number, their quota or ratio to the total enrollment is reached. *Quota sampling* works on the same idea. A certain number of persons is selected to represent subgroups that make up the population. The number or quota for each subgroup is set in advance and persons having the right characteristics are selected until that number is met.

An example may help explain quota sampling. Imagine that we wanted a sample of male heads of households in a village and we decided to use a quota sample design. Further, let's say we discovered that social status is an important variable for this study. Therefore, we want to be sure that our sample represents the population of male heads as well as possible with respect to social status. In talking with village elders, we learn that about 25% of the heads are considered poor, about 60% are in the middle range, and 15% are thought to be well off

by local standards. We want a sample, let's say, of 50 men: so we find the quota we need for each status group by multiplying the percentage in each group by the total. Thus, for the low status group the quota would be 25% times 50 or 12.5, which we could round to 12 men; the quota for the middle group would be 60%(50) or 30 men; and the quota for the high group would be 15% times 50 or 7.5 men, which could be rounded up to 8 men. Using these quotas you could walk around the village, talk with men, and then select and interview enough men to meet the quota for each group.

Quota sampling can be based on more than one selection factor, but this can get pretty complicated. If you want to use more than one factor, you will need to consult a book on sampling.

Quota sampling represents an improvement over convenience sampling. It is based on some definition of the intended population. Also, sub-groups of a population are consciously included in the sample. In our illustration, the quota sample would at least include male household heads for all three important social strata. If we had used a convenience sample, we might have included few poor heads because they probably would be less convenient to locate than middle or high status heads. But once the quotas are set, operationally, quota sampling becomes another instance of convenience sampling. Within each quota, the investigator uses personal judgment in selecting sampling elements, resulting in all the biases that occur with convenience sampling.

Quota sampling has another important limitation. The investigator has to know how the variable used for estimating quotas is distributed in the target population. In our illustration, we took the word of local elders for the proportions of low, middle, and high status heads in the village population. If reasonably accurate information is not available for establishing quotas, the sample becomes another form of convenience sampling, with all it limitations. The idea behind quota sampling can be adapted to limit some of the disadvantages of nonprobability samples.

7.6 Sample Size

How large should a sample be? There are several ways to answer this question? One answer depends on the purpose of the investigation. If the purpose is to explore some topic, sample size is not critical. Cases are selected until the investigator learns enough about the topic to meet his or her needs. For descriptive or explanatory studies, sample size is important because the size of a sample affects our ability to generalize results of the research.

Several factors have to be considered in deciding on the size of a sample. One is the heterogeneity of the population - how much the population varies with respect to any of the key variables being measured. A larger sample is needed for a population with a great deal of variation in contrast to a population in which persons are more alike. When there is relatively little variation in a population, say, by ethnic background or socio-economic status, a smaller sample can be used. When large differences exist within a population, a larger sample is needed to adequately reflect the variations in the population.

Another factor is the degree of accuracy desired for estimating the parameters in the population. Generally, larger samples will provide more accurate estimates than a smaller one. Sample size should also take into account the number of variables to be analyzed simultaneously. If variables are going to be analyzed one at a time, like describing means for ages of respondents, their years of schooling, or for measures of some attitude, smaller samples will do. When two or three variables are analyzed together, larger samples are necessary to ensure there are enough cases in the cells of the tables that will be involved.

There are precise ways to estimate how a sample should be to achieve a certain degree of accuracy for estimating population parameters, but these methods require detailed information about the population from which a sample is to be selected. The necessary data often are not available. To overcome this problem, some commonly accepted guidelines can help in deciding about the size of a sample. The size of the population, which we generally know with reasonable accuracy, influences how these guidelines are applied. Strangely, the required sample size is inverse to the size of the population. For populations under 1,000, a sampling ratio of about 30% of the cases is recommended. For a population of 10,000 or so, a 10% ratio is sufficient. As the population further increases, to 15,000 or larger, 1% of the cases can produce very accurate results. Random samples of 2,000 to 2,500 are usually accurate for populations in the millions.

The numbers mentioned may not be practical for individuals doing their own interviewing. Then, compromises have to be made. Statistical analyses, which we discuss in this module in some detail, should be based on a minimum of 30 cases, but at least 100 cases is recommended. The final size of a sample often is based on a compromise between larger ideal size and the largest practical size a researcher can manage. Researchers take into account the purpose of their study, the heterogeneity of the population being investigated, how precise they want the results to be (this requires some statistical knowledge), and make a decision.

Main points

1. Samples are used because it is frequently impractical to collect data from the large groups of persons or other entities, called the population that we want to learn about.
2. Probability sampling is based on selection of a sample entirely by chance, without any human judgment or preference. Probability sampling is also called random sampling.
3. Only probability sampling allows an investigator to generalize findings from a sample to the population from which it was drawn.
4. Necessary steps in sampling include: (1) defining the target population, (2) identification of a suitable sampling frame; and (3) random selection of the desired number of sample elements to compose the sample.
5. The most frequent problems in sampling are: (1) the target population is not clearly defined and delimited; (2) the sample frame does not match the target population; and (3) mistakes or errors are made in the process of selecting the sample.

6. Nonprobability samples sometimes have to be used. Kinds of nonprobability samples are: (1) the convenience or haphazard sample; (2) quota sample; purposive sample; and (4) the network sample, also called a chain or snowball sample.
7. Factors to be considered in deciding on sample size are: (1) how heterogeneous the population is; (2) how accurately one wishes to estimate parameters in the population; and (3) the number of variables that will be analyzed simultaneously. This said, samples of at least 100 cases are recommended.

Review questions

1. Discuss the advantages and limitations of sampling over census.
2. Why should we resort to sampling?
3. Why should we use nonprobability sampling? Describe probability and non probability sampling techniques.
4. define the following key terms:
    - Population
    - Target population
    - Chance selection
    - Sampling element
    - Self weighed sample
    - Weighed sample

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