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Quantitative Research Methods in Education

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Lesson 1**INTRODUCTION, DEFINITION & VALUE OF RESEARCH**

Whether we are aware of it or not, we are surrounded by research. Educators, administrators, government officials, business leaders, human service providers, health care professionals, regularly use social research findings in their jobs. Social research can be used to raise children, reduce crime, improve public health, sell products, improve workers' efficiency, or just understand one's life.

Assume for the moment that you are the Manager of a restaurant. You are experiencing a significant turnover in your waiter/waitress pool, and long-time customers have been commenting that the friendly atmosphere that has historically drawn them to your door is changing. What will you do? Where will you try to solve this problem? The problem of high turnover and decline in the friendly atmosphere at the restaurant has to be researched.

The study of research methods provides you with the knowledge and skills you need to solve the problem and meet the challenges of a fast-paced decision-making environment. A systematic inquiry whose objective is to provide information to the problems (be they managerial as in our example) is one way to explain research.

What is Research?

General image of the research is that it has something to do with the laboratory where scientists are supposedly doing some experiments. Somebody who is interviewing consumers to find out their opinion about the new packaging of milk is also doing research. Research is simply the process of finding solutions to a problem after through study and analysis of the situational factors. It is gathering information needed to answer a question, and thereby help in solving a problem. We do not do study in any haphazard manner. Instead we try to follow a system or a procedure in an organized manner. It is all the more necessary in case we want to repeat the study, or somebody else wants to verify our findings. In the latter case the other person has to follow the same procedure that we followed. Hence not only we have to do the study in a systematic manner but also that system should be known to others.

What is the value of Research?

The nature of research problems could vary. Problems may refer to some undesirable situation or these may refer to simply a curiosity of the researcher that may be agitating his or her mind. For example, in a recent BA/BS examination of the Punjab University 67 percent of the students failed. That is a colossal wastage of the resources, hence an undesirable situation that needs research to find a solution. The researcher may come up with a variety of reasons that may relate with the students, the teachers, the curricula, the availability of books, the examination system, the family environment of the student, and many more. So, a study may be carried out to diagnose the situation, and the recommendations to be applied to overcome the undesirable situation of mass failure of students.

In the same examination result one finds that girls have captured a good number of top positions; and that is happening for the last couple of years. One gets curious and tries to do research for finding out the reasons. This is an academic problem but certainly a research problem. Conducting such **research offers the pleasure of solving a puzzle**. Why the girls are catching most of the top positions in different examination? This might be a puzzle that the research may like to explain. Such findings make a good contribution to the body of knowledge i.e. making some good discoveries as part of the basic research. Finding answer to any enigma is self-satisfying.

The researchers try to make use of their findings for **generating theories and models** that could be used for understanding human behavior and the functioning of different structures both at the micro (organizational) and macro (societal) level.

Therefore, research may be considered as an *organized, systematic, data based, critical, objective, scientific inquiry or investigation into a specific problem*, undertaken with the purpose of finding answers or solutions to it. In this way research provides the needed information that guides the planners to make informed decisions to successfully deal with the problems. The information provided could be the result of a careful analysis of data gathered firsthand or of the data that are already available with an organization.

The value of research for policy makers, planners, business managers, and other stakeholders is that it reduces uncertainty by providing information that improves the decision-making process. The decision-making process associated with the development and implementation of a strategy involves four interrelated stages:

1. Identifying problems or opportunities;
2. Diagnosing and assessing problems or opportunities;
3. Selecting and implementing a course of action; and
4. Evaluating the course of action.

Identifying problems and solutions to the same problems is in fact applying the research findings to overcome an undesirable situation. Initially a problem may appear to be simply a ‘tip of the iceberg’ but the study by a professional might help locating the magnitude of the issue as well as its solutions. Such research is usually referred to as applied research, which shall be discussed in detail in the coming lectures.

Research helps in developing methodologies

By now we know that the researchers have to develop methodologies for carrying out the research. These methodologies are for the collection of data, data processing and data analysis. For the new researchers, these methodologies are already available, most of the researchers just use these. Nevertheless, there is always a scope for improvement and certainly new methodologies are developed. Also, we try to borrow methodologies from sister subjects.

Managers and administrators with knowledge of research have an advantage over those who are without. Though a manager/administrator him/herself may not be doing any major research yet he/she will have to understand, predict, and control events that are dysfunctional to the organization. For example, a new product developed may not be “taking off,” or a financial investment may not be “paying off” as anticipated. Such disturbing phenomena have to be understood and explained. Unless this is done, it will not be possible to predict the future of that product or the prospects of that investment, and how future catastrophic outcomes can be controlled. A grasp of research methods will enable managers/administrators to understand, predict, and control their environment.

Managers may not be doing the research themselves, in fact they could hire the services of professionals, and still they should be well conversant with research methodologies. The manager who is knowledgeable about research can interact effectively with outside researchers or consultants. Knowledge about research processes, design, and interpretation of data also helps managers to become discriminating recipients of the research findings presented, and to determine whether or not the recommended solution is appropriate for implementation.

We are surrounded by research

For the understanding of the professional works, incorporation of the new findings in the practical situations, and for the implementation of the recommendations in policy/planning, the managers have to be well conversant with researchers. Many of you may be preparing yourselves for such managerial positions, I am sure training in research methodology will certainly be helpful in your career.

SCIENTIFIC METHOD OF RESEARCH & ITS SPECIAL FEATURES

Research produces knowledge which could be used for the solution of problems as well as for the generation of universal theories, principles and laws. But all knowledge is not science. The critical factor that separates scientific knowledge from other ways of acquiring knowledge is that it uses scientific approach. What is this approach? Or what is science?

When most people hear the word *science*, the first image that comes to mind is one of test tubes, computers, rocket ships, and people in white lab coats. These outward trappings are part of science. Some sciences, such as the natural sciences deal with the physical and material world. Some other sciences involve the study of people – their beliefs, behavior, interactions, attitudes, institutions, and so forth. They are sometimes called *soft sciences*. This is not that their work is sloppy or lack rigor but because their subject matter, human social life, is fluid, formidable to observe, and hard to measure precisely with laboratory instruments. The subject matter of a science (e.g. human attitudes, protoplasm, or galaxies) determines the techniques and instruments (e.g. surveys, microscopes, or telescopes) used by it.

Science is a way to produce knowledge, which is based on truth and attempts to be universal. In other words, science is a method, a procedure to produce knowledge i.e. discovering universalities/principles, laws, and theories through the process of observation and re-observation. Observation here implies that scientists use “sensory experiences” for the study of the phenomena. They use their five senses, which are possessed by every normal human being. They not only do the observation of a phenomenon but also repeat the observation, may be several times. The researchers do so because they want to be accurate and definite about their findings

Re-observation may be made by the same researcher at a different time and place or done by other professionals at some other time or place. All such observations are made in this universe where a normal professional human being can go, make the observation and come back. Therefore, we are focusing on this universe not on the one hereafter. By repeating the observation, the researchers want to be definite and positive about their findings. Those who want to be definite and positive are often referred to as **positivists**. The researchers do not leave their findings into scattered bits and pieces. Rather the results are organized, systematized, and made part of the existing body of knowledge; and this is how the knowledge grows. All this procedure for the creation of knowledge is called a scientific method, whereby the consequent knowledge may be referred to as scientific knowledge. In this way *science* refers to both a system for producing knowledge and the knowledge produced from that system. Since the subject matters of the researchers differ, therefore, we have the diversification of different sciences: broadly natural or physical sciences and human sciences.

Important Characteristics of Scientific Method

1. Empirical

Scientific method is concerned with the realities that are observable through “sensory experiences.” It generates knowledge which is verifiable by experience or observation. Some of the realities could be directly observed, like the number of students present in the class and how many of them are male and how many females. The same students have attitudes, values, motivations, aspirations, and commitments. These are also realities which cannot be observed directly, but the researchers have designed ways to observe these indirectly. Any reality that cannot be put to “sensory experience” directly or indirectly (existence of heaven, the Day of Judgment, life hereafter, God’s rewards for good deeds) does not fall within the domain of scientific method.

2. Verifiable

Observations made through scientific method are to be verified again by using the senses to confirm or refute the previous findings. Such confirmations may have to be made by the same researcher or others. We will place more faith and credence in those findings and conclusions if similar findings emerge on the basis of data collected by other researchers using the same methods. To the extent that it

does happen (i.e. the results are replicated or repeated) we will gain confidence in the scientific nature of our research. Replicability, in this way, is an important characteristic of scientific method. Hence revelations and intuitions are out of the domain of scientific method.

3. Cumulative

Prior to the start of any study the researchers try to scan through the literature and see that their study is not a repetition in ignorance. Instead of reinventing the wheel the researchers take stock of the existing body of knowledge and try to build on it. Also, the researchers do not leave their research findings into scattered bits and pieces. Facts and figures are to be provided with language and thereby inferences drawn. The results are to be organized and systematized. Nevertheless, we don't want to leave our studies as stand alone. A linkage between the present and the previous body of knowledge has to be established, and that is how the knowledge accumulates. Every new crop of babies does not have to start from a scratch; the existing body of knowledge provides a huge foundation on which the researchers build on and hence the knowledge keeps on growing.

4. Deterministic

Science is based on the assumption that all events have antecedent causes that are subject to identification and logical understanding. For the scientist, nothing “just happens” – it happens for a reason. The scientific researchers try to explain the emerging phenomenon by identifying its causes. Of the identified causes, which ones can be the most important? For example, in the 2006 BA/BS examination of the Punjab University 67 percent of the students failed. What could be the determinants of such a mass failure of students? The researcher may try to explain this phenomenon and come up with variety of reasons which may pertain to students, teachers, administration, curriculum, books, examination system, and so on. Looking into such a large number of reasons may be highly cumbersome model for problem solution. It might be appropriate to tell, of all these factors which one is the most important, the second most important, the third most important, which two in combination are the most important. The researcher tries to narrow down the number of reasons in such a way that some action could be taken. Therefore, the achievement of a meaningful, rather than an elaborate and cumbersome, model for problem solution becomes a critical issue in research. That is parsimony which implies the explanation with the minimum number of variables that are responsible for an undesirable situation.

5. Ethical and Ideological Neutrality

The conclusions drawn through interpretation of the results of data analysis should be objective; that is, they should be based on the facts of the findings derived from actual data, and not on our own subjective or emotional values. For instance, if we had a hypothesis that stated that greater participation in decision making will increase organizational commitment, and this was not supported by the results, it makes no sense if the researcher continues to argue that increased opportunities for employee participation would still help. Such an argument would be based, not on the factual, data based research findings, but on the subjective opinion of the researcher. If this was the conviction of the researcher all along, then there was no need to do the research in the first place.

Researchers are human beings, having individual ideologies, religious affiliations, cultural differences which can influence the research findings. Any interference of their personal likings and dis-likings in their research can contaminate the purity of the data, which ultimately can affect the predictions made by the researcher. Therefore, one of the important characteristics of scientific method is to follow the principle of objectivity, uphold neutrality, and present the results in an unbiased manner.

6. Statistical Generalization

Generalizability refers to the scope of the research findings in one organizational setting to other settings. Obviously, the wider the range of applicability of the solutions generated by research, the more useful the research is to users. For instance, if a researcher's findings that participation in decision making enhances organizational commitment are found to be true in a variety of manufacturing, industrial, and service organizations, and not merely in the particular organization studied by the researcher, the generalizability of the findings to other organizational settings is enhanced. The more generalizable the research, the greater its usefulness and value.

For wider generalizability, the research sampling design has to be logically developed and a number of other details in the data collection methods need to be meticulously followed. Here the use of statistics is very helpful. Statistics is device for comparing what is observed and what is logically expected. The use of statistics becomes helpful in making generalizations, which is one of the goals of scientific method.

7. Rationalism

Science is fundamentally a rational activity, and the scientific explanation must make sense. Religion may rest on revelations, custom, or traditions, gambling on faith, but science must rest on logical reason. There are two distinct logical systems important to the scientific quest, referred to as deductive logic and inductive logic. Beveridge describes them as follows:

Logicians distinguish between inductive reasoning (from particular instances to general principles, from facts to theories) and deductive reasoning (from the general to the particular, applying a theory to a particular case) . In induction one starts from observed data and develops a generalization which explains the relationships between the objects observed. On the other hand, in deductive reasoning one starts from some general law and applies it to a particular instance.

The classical illustration of deductive logic is the familiar syllogism: "All men are mortal; Mahmood is man; therefore, Mahmood is mortal." A researcher might then follow up this deductive exercise with an empirical test of Mahmood's mortality.

Using inductive logic, the researcher might begin by noting that Mahmood is mortal and observing a number of other mortals as well. He might then note that all the observed mortals were men, thereby arriving at the tentative conclusion that all men are mortal.

In practice, scientific research involves both inductive and deductive reasoning as the scientist shifts endlessly back and forth between theory and empirical observations.

There could be some other aspects of scientific method (e.g. self-correcting) but what is important is that **all features are interrelated**. Scientists may not adhere to all these characteristics. For example, objectivity is often violated especially in the study of human behavior, particularly when human beings are studied by the human beings. Personal biases of the researchers do contaminate the findings. Looking at the important features of scientific method one might say that there are **two power bases of scientific knowledge**: (1) empiricism i.e. sensory experiences or observation, and (2) rationalism i.e. the logical explanations for regularity and then consequential argumentation for making generalizations (theory).

Finally, it may be said that anybody who is following the scientific procedure of doing research is doing a scientific research; and the knowledge generated by such research is scientific knowledge. Depending upon the subject matter, we try to divide the sciences into physical or natural sciences and the social sciences. Due to the nature of the subject matter of the social sciences, it is rather very difficult to apply the scientific method of research rigorously and that is why the predictions made by the social researchers are not as dependable as the predictions made by the natural scientists.

CLASSIFICATION of RESEARCH

Research comes in many shapes and sizes. Before a researcher begins to conduct a study, he or she must decide on a specific type of research. Good researchers understand the advantages and disadvantages of each type, although most end up specializing in one. For classification of research we shall look from four dimensions:

1. The purpose of doing research;
2. The intended uses of research;
3. How it treats time i.e. the time dimension in research; and
4. The research (data collection) techniques used in it.

The four dimensions reinforce each other; that is, a purpose tends to go with certain techniques and particular uses. Few studies are pure types, but the dimensions simplify the complexity of conducting research.

1. Purpose of Doing Research

If we ask someone why he or she is conducting a study, we might get a range of responses: “My boss told me to do”; “It was a class assignment”; “I was curious.” There are almost as many reasons to do research as there are researches. Yet the purposes of research may be organized into three groups based on what the researcher is trying to accomplish – explore a new topic, describe a social phenomenon, or explain why something occurs. Studies may have multiple purposes (e.g. both to explore and to describe) but one purpose usually dominates.

a. Exploratory/Formulative Research

You may be **exploring a new topic** or issue in order to learn about it. If the issue was new or the researcher has written little on it, you began at the beginning. This is called *exploratory research*. The researcher’s goal is to formulate more precise questions that future research can answer. Exploratory research may be the first stage in a sequence of studies. A researcher may need to know enough to design and execute a second, more systematic and extensive study.

Initial research conducted to clarify the nature of the problem. When a researcher has a limited amount of experience with or knowledge about a research issue, **exploratory research** is useful preliminary step that helps ensure that a more rigorous, more conclusive future study will not begin with an inadequate understanding of the nature of the management problem. The findings discovered through exploratory research would the researchers to emphasize learning more about the particulars of the findings in subsequent conclusive studies.

Exploratory research rarely yields definitive answers. It addresses the “what” question: “what is this social activity really about?” It is difficult to conduct because there are few guidelines to follow. Specifically, there could be a number of goals of exploratory research.

Goals of Exploratory Research:

1. Become familiar with the basic facts, setting, and concerns;
2. Develop well-grounded picture of the situation;
3. Develop tentative theories, generate new ideas, conjectures, or hypotheses;
4. Determine the feasibility of conducting the study;
5. Formulate questions and refine issues for more systematic inquiry; and
6. Develop techniques and a sense of direction for future research.

For exploratory research, the researcher may use different sources for getting information like (1) experience surveys, (2) secondary data analysis, (3) case studies, and (4) pilot studies.

As part of the experience survey the researcher tries to contact individuals who are knowledgeable about a particular research problem. This constitutes an informal experience survey.

Another economical and quick source of background information is secondary data analysis. It is preliminary review of data collected for another purpose to clarify issues in the early stages of a research effort.

The purpose of case study is to obtain information from one or a few situations that are similar to the researcher's problem situation. A researcher interested in doing a nationwide survey among union workers, may first look at a few local unions to identify the nature of any problems or topics that should be investigated.

A pilot study implies that some aspect of the research is done on a small scale. For this purpose focus group discussions could be carried out.

b. Descriptive Research

Descriptive research presents a picture of the specific details of a situation, social setting, or relationship. The major purpose of descriptive research, as the term implies, is to describe characteristics of a population or phenomenon. Descriptive research seeks to determine the answers to *who, what, when, where, and how* questions. Labor Force Surveys, Population Census, and Educational Census are examples of such research.

Descriptive study offers to the researcher a profile or description of relevant aspects of the phenomena of interest. Look at the class in research methods and try to give its profile – the characteristics of the students. When we start to look at the relationship of the variables, then it may help in diagnosis analysis.

Goals of Descriptive Research

1. Describe the situation in terms of its characteristics i.e. provide an accurate profile of a group;
2. Give a verbal or numerical picture (%) of the situation;
3. Present background information;
4. Create a set of categories or classify the information;
5. Clarify sequence, set of stages; and
6. Focus on 'who,' 'what,' 'when,' 'where,' and 'how' but not why?

A great deal of social research is descriptive. Descriptive researchers use most data –gathering techniques – surveys, field research, and content analysis

c. Explanatory Research

When we encounter an issue that is already known and have a description of it, we might begin to wonder *why* things are the way they are. The desire to know “why,” to explain, is the purpose of *explanatory research*. It builds on exploratory and descriptive research and goes on to identify the reasons for something that occurs. Explanatory research looks for causes and reasons. For example, a descriptive research may discover that 10 percent of the parents abuse their children, whereas the explanatory researcher is more interested in learning *why* parents abuse their children.

Goals of Explanatory Research

1. Explain things not just reporting. Why? Elaborate and enrich a theory's explanation.
2. Determine which of several explanations is best.
3. Determine the accuracy of the theory; test a theory's predictions or principle.
4. Advance knowledge about underlying process.
5. Build and elaborate a theory; elaborate and enrich a theory's predictions or principle.
6. Extend a theory or principle to new areas, new issues, new topics:
7. Provide evidence to support or refute an explanation or prediction.

8. Test a theory's predictions or principles

2. The Uses of Research

Some researchers focus on using research to advance general knowledge, whereas others use it to solve specific problems. Those who seek an understanding of the fundamental nature of social reality are engaged in basic research (also called academic research or pure research or fundamental research). Applied researchers, by contrast, primarily want to apply and tailor knowledge to address a specific practical issue. They want to answer a policy question or solve a pressing social and economic problem.

a. Basic Research

Basic research advances fundamental knowledge about the human world. It focuses on refuting or supporting theories that explain how this world operates, what makes things happen, why social relations are a certain way, and why society changes. Basic research is the source of most new scientific ideas and ways of thinking about the world. It can be exploratory, descriptive, or explanatory; however, explanatory research is the most common.

Basic research generates new ideas, principles and theories, which may not be immediately utilized; though are the foundations of modern progress and development in different fields. Today's computers could not exist without the pure research in mathematics conducted over a century ago, for which there was no known practical application at that time.

Police officers trying to prevent delinquency or counselors of youthful offenders may see little relevance to basic research on the question, "Why does deviant behavior occur?" Basic research rarely helps practitioners directly with their everyday concerns. Nevertheless, it stimulates new ways of thinking about deviance that have the potential to revolutionize and dramatically improve how practitioners deal with a problem.

A new idea or fundamental knowledge is not generated only by basic research. Applied research, too, can build new knowledge. Nonetheless, basic research is essential for nourishing the expansion of knowledge. Researchers at the center of the scientific community conduct most of the basic research.

b. Applied Research

Applied researchers try to solve specific policy problems or help practitioners accomplish tasks. Theory is less central to them than seeking a solution on a specific problem for a limited setting. Applied research is frequently a descriptive research, and its main strength is its immediate practical use. Applied research is conducted when decision must be made about a specific real-life problem. Applied research encompasses those studies undertaken to answer questions about specific problems or to make decisions about a particular course of action or policy. For example, an organization contemplating a paperless office and a networking system for the company's personal computers may conduct research to learn the amount of time its employees spend at personal computers in an average week.

c. Basic and Applied Research Compared

The procedures and techniques utilized by basic and applied researchers do not differ substantially. Both employ the scientific method to answer the questions at hand.

The scientific community is the primary consumer of basic research. The consumers of applied research findings are practitioners such as teachers, counselors, and caseworkers, or decision makers such as managers, committees, and officials. Often, someone other than the researcher who conducted the study uses the results of applied research. This means that applied researchers have an obligation to translate findings from scientific technical language into the language of decision makers or practitioners.

The results of applied research are less likely to enter the public domain in publications. Results may be available only to a small number of decision makers or practitioners, who decide whether or how to put the research results into practice and who may or may not use the results.

Applied and basic researchers adopt different orientations toward research methodology. Basic researchers emphasize high standards and try to conduct near-perfect research. Applied researchers

make more trade-offs. They may compromise scientific rigor to get quick, usable results. Compromise is no excuse for sloppy research, however. Applied researchers squeeze research into the constraints of an applied setting and balance rigor against practical needs. Such balancing requires an in-depth knowledge of research and an awareness of the consequences of compromising standards.

d. Types of Applied Research

Practitioners use several types of applied research. Some of the major ones are:

i) Action research: The applied research that treats knowledge as a form of power and abolishes the line between research and social action. Those who are being studied participate in the research process; research incorporates ordinary or popular knowledge; research focuses on power with a goal of empowerment; research seeks to raise consciousness or increase awareness; and research is tied directly to political action.

The researchers try to advance a cause or improve conditions by expanding public awareness. They are explicitly political, not value neutral. Because the goal is to improve the conditions of research participants, formal reports, articles, or books become secondary. Action researchers assume that knowledge develops from experience, particularly the experience of social-political action. They also assume that ordinary people can become aware of conditions and learn to take actions that can bring about improvement.

ii) Impact Assessment Research: Its purpose is to estimate the likely consequences of a planned change. Such an assessment is used for planning and making choices among alternative policies – to make an impact assessment of Basha Dam on the environment; to determine changes in housing if a major new highway is built.

iii) Evaluation Research: It addresses the question, “Did it work?” The process of establishing value judgment based on evidence about the achievement of the goals of a program. Evaluation research measures the effectiveness of a program, policy, or way of doing something. “Did the program work?” “Did it achieve its objectives?” Evaluation researchers use several research techniques (survey, field research).

Practitioners involved with a policy or program may conduct evaluation research for their own information or at the request of outside decision makers, who sometime place limits on researchers by setting boundaries on what can be studied and determining the outcome of interest.

Two types of evaluation research are formative and summative. *Formative evaluation* is built-in monitoring or continuous feedback on a program used for program management. *Summative evaluation* looks at final program outcomes. Both are usually necessary.

3. The Time Dimension in Research

Another dimension of research is the treatment of time. Some studies give us a snapshot of a single, fixed time point and allow us to analyze it in detail. Other studies provide a moving picture that lets us follow events, people, or sale of products over a period of time. In this way from the angle of time research could be divided into two broad types:

- a. **Cross-Sectional Research.** In *cross-sectional research*, researchers observe at one point in time. Cross-sectional research is usually the simplest and least costly alternative. Its disadvantage is that it cannot capture the change processes. Cross-sectional research can be exploratory, descriptive, or explanatory, but it is most consistent with a descriptive approach to research.
- b. **Longitudinal Research.** Researchers using *longitudinal research* examine features of people or other units at more than one time. It is usually more complex and costly than cross-sectional research but it is also more powerful, especially when researchers seek answers to questions about change. There are three types of longitudinal research: time series, panel, and cohort.

- i. *Time series research* is longitudinal study in which the same type of information is collected on a group of people or other units across multiple time periods. Researcher can observe stability or change in the features of the units or can track conditions overtime. One could track the characteristics of students registering in the course on Research Methods over a period of four years i.e. the characteristics (Total, age characteristics, gender distribution, subject distribution, and geographic distribution). Such an analysis could tell us the trends in the characteristic over the four years.
- ii. *The panel study* is a powerful type of longitudinal research. In panel study, the researcher observes exactly the same people, group, or organization across time periods. It is a difficult to carry out such study. Tracking people over time is often difficult because some people die or cannot be located. Nevertheless, the results of a well-designed panel study are very valuable.
- iii. A cohort analysis is similar to the panel study, but rather than observing the exact same people, a category of people who share a similar life experience in a specified time period is studied. The focus is on the cohort, or category, not on specific individuals. Commonly used cohorts include all people born in the same year (called birth cohorts), all people hired at the same time, all people retire on one or two- y e a r time frame, and all people who graduate in a given year. Unlike panel studies, researchers do not have to locate the exact same people for cohort studies. The only need to identify those who experienced a common life event.

4. Research (data collection) Techniques Used

Every researcher collects data using one or more techniques. The techniques may be grouped into two categories: *quantitative*, collecting data in the form of numbers, and *qualitative*, collecting data in the form of words or pictures.

a. Quantitative

The main quantitative techniques are:

1. Experiments
2. Surveys
3. Content Analysis
4. Using Existing

Statistics

5. b. Qualitative

The major qualitative techniques of research are:

1. Field Research
2. Case Study
3. Focus Group Discussion

Details about the quantitative and qualitative techniques of research shall be discussed later.

Lesson no 4

Concepts are an Abstraction of Reality

Concepts are everywhere, and you use them all the time. Height is simple concept form everyday experience. What does it mean? It is easy to use the concept of height, but describing the concept itself is difficult. It represents an abstract idea about physical reality, or **an abstraction of reality**. Height is a characteristic of physical objects, the distance from top to bottom. All people, buildings, trees, mountains, books and so forth have height. The word height refers to an abstract idea. We associate its sound and its written form with that idea. There is nothing inherent in the sounds that make up the word and the idea it represents. The connection is arbitrary, but it is still useful. People can express the abstract idea to one another using the symbols.

In other words, concepts are the abstractions of reality – physical of non-physical like table, leadership, productivity, and morale are all labels given to some phenomenon (reality). The concepts stand for phenomenon not the phenomenon itself; hence it may be called an abstraction of empirical reality.

Degree of Abstraction

Concepts vary in their level of abstraction. They are on a continuum from the most concrete to the most abstract. Very concrete ones refer to straightforward physical objects or familiar experiences (e.g. height, school, age, family income, or housing). More abstract concepts refer to ideas that have a diffuse, indirect expression (e.g. family dissolution, racism, political power)

The organization of concepts in sequence from the most concrete and individual to the most general indicates the degree of abstraction. Moving up the ladder of abstraction, the basic concept becomes more abstract, wider in scope, and less amenable to measurement. The scientific researcher operates at two levels of concepts (and propositions) and on the empirical level of variables. At the empirical level, we experience reality – that is we observe objects or events.

Sources of Concepts

Everyday culture is filled with concepts, but many of them have vague and unclear definitions. Likewise, the values and experiences of people in a culture may limit everyday concepts. Nevertheless, we borrow concepts from everyday culture; though these to be refined.

We create concepts from personal experiences, creative thought, or observation. The classical theorist originated many concepts like family system, gender role, socialization, self-worth, frustration, and displaced aggression. We also borrow concepts from sister disciplines.

CONCEPTS, CONCRETE AND ABSTRACT

Importance of Concepts

Social science concepts form a specialized language, or *jargon*. Specialists use jargon as a short hand way to communicate with one another. Most fields have their own jargon. Physicians, lawyers, engineers, accountants, plumbers, and auto mechanics all have specialized languages. They use their jargon to refer to the ideas and objects with which they work. Special problems grow out of the need for concept precision and inventiveness. Vague meanings attached to a concept create problems of measurement. Therefore, not only the construction of concepts is necessary but also these should be precise and the researchers should have some agreement to its meaning.

Identification of concepts is necessary because we use concepts in hypothesis formulation. Here too one of the characteristics of a good hypothesis is that it should be conceptually clear.

The success of research hinges on (1) how clearly, we conceptualize and (2) how well others understand the concept we use. For example, we might ask respondents for an estimate of their family income. This may seem to be a simple, unambiguous concept, but we may receive varying and confusing answers unless we restrict or narrow the concept by specifying:

- Time period, such as weekly, monthly, or annually.
- Before or after income taxes.
- For head of the family only or for all family members.
- For salary and wages only or also for dividends, interest, and capital gains.
- Income in kind, such as free rent, employee discounts, or food stamps.

Definitions

Confusion about the meaning of concepts can destroy a research study's value without the researcher or client even knowing it. If words have different meanings to the parties involved, then they are not communicating on the same wave-length. Definitions are one way to reduce this danger.

Dictionary Definitions

Researchers must struggle with two types of definitions. In the more familiar dictionary, a concept is defined with synonyms. For example, a customer is defined as a patron: a patron, in turn, is defined as customer or client of an establishment; a client is defined as one who employs the services of any professional ..., also loosely, a patron of any shop. These circular definitions may be adequate for general communication but not for research.

Dictionary definitions are also called conceptual or theoretical or nominal definitions. Conceptual definition is a definition in abstract, theoretical terms. It refers to other ideas or constructs. There is no magical way to turn a construct into precise conceptual definition. It involves thinking carefully, observing directly, consulting with others, reading what others have said, and trying possible definitions.

A single construct can have several definitions, and people may disagree over definitions. Conceptual definitions are linked to theoretical frameworks and to value positions. For example, a conflict theorist may define *social class* as the power and property a group of people in a society has or lacks. A structural functionalist defines it in terms of individual who share a social status, life-style, or subjective justification. Although people disagree over definitions, the researcher should always state explicitly which definition he or she is using.

Some constructs are highly abstract and complex. They contain lower level concepts within them (e.g. powerlessness), which can be made even more specific (e.g. a feeling of little power over wherever one lives). Other concepts are concrete and simple (e.g. age). When developing definitions, a researcher needs to be aware of how complex and abstract a construct is. For example, a concrete construct such as age is easier to define (e.g. number of years that have passed since birth) than is a complex, abstract concept such as morale.

Operational Definition

In research, we must measure concepts and constructs, and this requires more rigorous definitions. A concept must be made operational in order to be measured. An operational definition gives meanings to a concept by specifying the activities or operations necessary to measure it. An operational definition specifies what must be done to measure the concept under investigation. It is like a manual of instruction or a recipe: do such-and-such in so-and-so manner.

Operational definition is also called a *working definition* stated in terms of specific testing or measurement criteria. The concepts must have empirical referents (i.e. we must be able to count, measure, or in some other way gather the information through our senses). Whether the object to be defined is physical e.g. a machine tool) or highly abstract (e.g. achievement motivation), the definition must specify characteristics and how to be observed. The specification and procedures must be so clear that any competent person using them would classify the objects the same way. So in operational definition we must specify concrete indicators that can be observed/measured (observable indicators).

Use both Definitions in Research

Look at observable phenomenon, we construct a label for it, then try to define it theoretically, which gives a lead to the development of criteria for its measurement, and finally we gather the data.

VARIABLES AND TYPES OF VARIABLES

Variable is central idea in research. Simply defined, variable is a concept that varies. There are two types of concepts: those that refer to a fixed phenomenon and those that vary in quantity, intensity, or amount (e.g. amount of education). The second type of concept and measures of the concept are variables. A variable is defined as anything that varies or changes in value. Variables take on two or more values. Because variable represents a quality that can exhibit differences in value, usually magnitude or strength, it may be said that a variable generally is anything that may assume different numerical or categorical values. Once you begin to look for them, you will see variables everywhere. For example, gender is a variable; it can take two values: male or female. Marital status is a variable; it can take on values of never married, single, married, divorced, or widowed. Family income is a variable; it can take on values from zero to billions of Rupees. A person's attitude toward women empowerment is variable; it can range from highly favorable to highly unfavorable. In this way, the variation can be in quantity, intensity, amount, or type; the examples can be production units, absenteeism, gender, religion, motivation, grade, and age. A variable may be situation specific; for example, gender is a variable but if in a particular situation like a class of Research Methods if there are only female students, then in this situation gender will not be considered as a variable.

Types of Variable

1. Continuous and Discontinuous variables

Variables have different properties and to these properties we assign numerical values. If the values of a variable can be divided into fractions, then we call it a *continuous variable*. Such a variable can take infinite number of values. Income, temperature, age, or a test score are examples of continuous variables. These variables may take on values within a given range or, in some cases, an infinite set.

Any variable that has a limited number of distinct values and which cannot be divided into fractions, is a *discontinuous variable*. Such a variable is also called as *categorical variable* or *classificatory variable*, or *discrete variable*. Some variables have only two values, reflecting the presence or absence of a property: employed-unemployed or male-female have two values. These variables are referred to as dichotomous. There are others that can take added categories such as the demographic variables of race, religion. All such variables that produce data that fit into categories are said to be discrete/categorical/classificatory, since only certain values are possible. An automotive variable, for example, where “Chevrolet” is assigned a 5 and “Honda” is assigned a 6, provides no option for a 5.5 (i.e. the values cannot be divided into fractions).

2. Dependent and Independent Variables

Researchers who focus on causal relations usually begin with an effect, and then search for its causes. The cause variable, or the one that identifies forces or conditions that act on something else, is the *independent variable*. The variable that is the effect or is the result or outcome of another variable is the *dependent variable* (also referred to as outcome variable or effect variable). The independent variable is “independent of” prior causes that act on it, whereas the dependent variable “depends on” the cause.

It is not always easy to determine whether a variable is independent or dependent. Two questions help to identify the independent variable. First, does it come before other variable in time? Second, if the variables occur at the same time, does the researcher suggest that one variable has an impact on another variable? Independent variables affect or have an impact on other variables. When independent variable is present, the dependent variable is also present, and with each unit of increase in the independent variable, there is an increase or decrease in the dependent variable also. In other words, the variance in dependent variable is accounted for by the independent variable. Dependent variable is also referred to as *criterion* variable.

In statistical analysis, a variable is identified by the symbol (X) for independent variable and by the symbol (Y) for the dependent variable. In the research vocabulary, different labels have been associated with the independent and dependent variables like:

Independent variable**Dependent variable**

Presumed cause	presumed effect
Stimulus	Response
Predicted from ...	Predicted to ...
Antecedent	Consequence
Manipulated	Measured outcome
Predictor	Criterion

Research studies indicate that successful new product development has an influence on the stock market price of a company. That is, the more successful the new product turns out to be, the higher will be the stock market price of that firm. Therefore, the **success of the new product** is the *independent variable*, and **stock market price** the *dependent variable*.

The degree of perceived success of the new product developed will explain the variance in the stock market price of the company.

It is important to remember that there are no preordained variables waiting to be discovered “out there” that are automatically assigned to be independent or dependent. It is in fact the product of the researcher’s imagination demonstrated convincingly.



3. Moderating Variables

A moderating variable is one that has a strong *contingent* effect on the independent variable- dependent variable relationship. That is, the presence of a third variable (the moderating variable) modifies the original relationship between the independent and the dependent variable.

For example, a strong relationship has been observed between the quality of library facilities (X) and the performance of the students (Y). Although this relationship is supposed to be true generally, it is **nevertheless contingent on the interest and inclination of the students**. It means that only those students who have the interest and inclination to use the library will show improved performance in their studies. In this relationship **interest and inclination** is moderating variable i.e. which moderates the strength of the association between X and Y variables.

4. Intervening Variables

A basic causal relationship requires only independent and dependent variable. A third type of variable, the *intervening variable*, appears in more complex causal relationships. It comes between the independent and dependent variables and shows the link or mechanism between them. Advances in knowledge depend not only on documenting cause and effect relationship but also on specifying the mechanisms that account for the causal relation. In a sense, the intervening variable acts as a dependent variable with respect to independent variable and acts as an independent variable toward the dependent variable.

A theory of suicide states that married people are less likely to commit suicide than single people. The assumption is that married people have greater social integration (e.g. feelings of belonging to a group or family). Hence a major cause of one type of suicide was that people lacked a sense of belonging to group (family). Thus, this theory can be restated as a three-variable relationship: marital

status (independent variable) causes the degree of social integration (intervening variable), which affects suicide (dependent variable). Specifying the chain of causality makes the linkages in theory clearer and helps a researcher test complex relationships.

Look at another finding that five-day work week results in higher productivity. What is the process of moving from the independent variable to the dependent variable? What exactly is that factor which theoretically affects the observed phenomenon but cannot be seen? Its effects must be inferred from the effects of independent variable on the dependent variable. In this work-week hypothesis, one might view the intervening variable to be the job satisfaction. To rephrase the statement, it could be: the introduction of five-day work week (IV) will increase job satisfaction (IVV), which will lead to higher productivity (DV).

5. Extraneous Variables

An almost infinite number of extraneous variables (EV) exist that might conceivably affect a given relationship. Some can be treated as independent or moderating variables, but most must either be assumed or excluded from the study. Such variables have to be identified by the researcher. In order to identify the true relationship between the independent and the dependent variable, the effect of the extraneous variables may have to be controlled. This is necessary if we are conducting an experiment where the effect of the confounding factors has to be controlled. Confounding factors is another name used for extraneous variables.

Relationship among Variables

Once the variables relevant to the topic of research have been identified, then the researcher is interested in the relationship among them. A statement containing the variable is called a proposition. It may contain one or more than one variable. The proposition having one variable in it may be called as univariate proposition, those with two variables as bivariate proposition, and then of course multivariate containing three or more variables. Prior to the formulation of a proposition the researcher has to develop strong logical arguments which could help in establishing the relationship. For example, age at marriage and education are the two variables that could lead to a proposition: the higher the education, the higher the age at marriage. What could be the logic to reach this conclusion? All relationships have to be explained with strong logical arguments.

If the relationship refers to an observable reality, then the proposition can be put to test, and any testable proposition is hypothesis.

THE RESEARCH PROCESS

Research task is usually treated as a sequential process involving several clearly defined steps. No one claims that research requires completion of each step before going to the next. Recycling, circumventing, and skipping occur. Some steps are begun out of sequence, some are carried out simultaneously, and some may be omitted. Despite these variations, the idea of sequence is useful for developing a project and for keeping the project orderly as it unfolds.

Various approaches suggest somewhat different steps – ranging from five steps to eleven steps. The variation may be due to purposes, and methods used by the researchers, though some researchers may combine some of the steps. Also, some writers may portray the same steps in a linear way; others may put them in a cyclical form. These steps can be:

1. Broad Problem Area

The process begins with a researcher selecting a *topic* – a general area of study or issue such as divorce, crime, aging, marketing, or powerful elites. A topic appears to be too broad for conducting research. The specific issues that need to be researched within the situation may not be identified at this stage. Such issues might pertain to (1) problem currently existing in an organizational setting that need to be solved (sexual harassment), (2) areas that a manager believes need to be improved in the organization (improving the existing policies), (3) a conceptual or theoretical issue that needs to be tightened up for basic researcher or to understand certain phenomenon (conceptual definition of harassment), and (4) some research questions that a basic researcher wants to answer empirically (impact of harassment on the performance of the workers).

2. Preliminary Data Collection

This step may be considered as part of the **exploratory** research. An exploration typically begins with a search for published data and studies. Such sources can provide secondary data which becomes part of the background information (about the organization, groups of people, context of the issue). Some secondary sources of data are statistical bulletins, government publications, information published or unpublished, case studies, online data, web sites, and the Internet. In addition, the researchers often seek out people who are well informed on the topic, especially those who have clearly stated positions on controversial aspects of the problem. Such persons can be the professional researchers, or the informants to whom the issues relate. In certain situations, it may be appropriate to have some focus group discussions with the relevant people. Such discussions help in the identification of variables and having clarification of the issue

3. Problem Definition

After having discussions with the professionals as well as with the persons to whom the issue relates, and the review of literature, the researcher is in a position to narrow down from its original broad base and define the issue clearly. Translate the broad issue into a research question. As part of the applied research convert the management dilemma into a management question, and then on to research question that fits the need to resolve the dilemma. The symptoms of a problem might help tracing the real problem. For example, a productivity decline of workers may be an issue. The management may have tried to solve it by the provision of incentive but did not work. The researcher may have to dig deep and find the possible factors like the morale and motivation of the workers having some other antecedents. There could be similar other broad issues which have to be narrowed down to research questions like:

1. To what extent has the new advertising campaign been successful in creating the high quality, consumer-centered corporate image that it was intended to produce?
2. Has the new packaging affected the sale of the products?
3. Will the day care centers affect the productivity of female workers?
4. Why the divorce rate is on the increase in Pakistan?

5. Why the family in Pakistan is changing?

6. What could be the impact of changing family patterns on the living of senior citizens?

4. Theoretical Framework

Consultations with the informants and professionals, and the review of literature should have helped in the identification of different factors that are considered to be relevant to the topic. The researcher has to make logical relationship among several factors identified earlier. This will help in the delineation of the theoretical framework. The theoretical framework discusses the interrelationships among the variables that are deemed to be integral to the dynamics of the situation being investigated. Developing such a conceptual framework helps to postulate or hypothesize and test certain relationships.

We have already discussed the components of a theoretical framework.

5. Generation of Hypotheses

Once we have identified the important variables relevant to an issue and established the logical reasoning in the theoretical framework, we are in a position to test whether the relationships that have been theorized do in fact hold true. By testing these relationships scientifically, we are in a position to obtain reliable information to determine the relationship among the variables. The results of these tests offer us part of the answers to the formulated research questions, whether these relate basic research or to applied research.

6. Research Design

Research design is a master plan specifying the methods and procedures for collecting and analyzing the needed information. It is a framework or the blueprint that plans the action for research project. The objectives of the study determined during the early stages of the research are included in the design to ensure that the information collected is appropriate for solving the problem. The researcher must specify the sources of information, and the research method or technique (survey or experiment, for example) to be followed in the study.

Broadly there are six basic research methods for descriptive and causal research: surveys, experiments, observation, communication analysis (content analysis), case study, focus group discussion. Use of secondary data may be another method where the data may have been collected by using any of the six basic methods listed earlier. The objectives of the research, the available data sources the urgency of the decision and the cost of obtaining the data will determine the method to be chosen.

Surveys: The most common method of generating primary data is through surveys. Survey is a research technique in which information is gathered from a sample of people using a questionnaire. The task of writing a list of questions and designing the exact format of the printed or written questionnaire is an essential aspect of the development of survey research design.

Research investigators may choose to contact the respondents in person, by telephone, by mail, or on the internet. Each of these techniques has advantages and disadvantages. The researcher's task is to choose the most appropriate one for collecting the information needed.

Experiments: Experiments hold the greatest potential for establishing cause-and-effect relationships. The use of experimentation allows investigation of changes in one variable, such as productivity, while manipulating one or more variables, perhaps social rewards or monetary rewards, under controlled conditions. Ideally, experimental control provides a basis for isolating causal factors, because outside (or exogenous) influences do not come into play.

An experiment controls conditions so that one or more variables can be manipulated in order to test a hypothesis. In the laboratory experiments, compared with the field experiment, it is possible to create controlled conditions for the manipulation of one or more variables and see its effect on the dependent variable by holding the extraneous factors constant.

Observation techniques: Observation can be non-participant or participant. In many situations, the objective of a research project is merely to record what can be observed – for example the number of automobiles that pass the proposed site for a gas station. This can be mechanically recorded or observed by any person. This is an unobtrusive study without a respondent's direct participation. In participant observation studies, the researcher takes part in the day to day activities, interviews them, and makes observations. Such a study generates qualitative data and lasts for a long duration.

Communication analysis: It is also called content analysis which means gathering and analyzing the content of the text. The content refers to words, meanings, pictures, symbols, ideas, themes, or any message that can be communicated. The text is anything written, visual, or spoken that serves as a medium of communication. It includes books, newspapers, advertisements, speeches, official documents, films or videotapes, photographs, articles of clothing, or works of art.

Case study: It is an in-depth analysis of a unit which could be an individual person, a couple, a group, or an organization. It is more like a clinical analysis in retrospect; starting from the effect and tracing the reasons back in time. The researcher takes the history of the situation and makes use of any other relevant information about the case to identify the factors leading to the present situation.

Focus group discussions: It is a discussion of an issue by 6-12 persons with a moderator for 1-2 hours. The issue can be a public concern, a product, a television program, a political candidate, or a policy. Focus groups are useful in exploratory research or to generate new ideas for hypotheses, and the interpretation of results. It produces qualitative information which may compliment the quantitative data.

Researchers try to evaluate different research designs and select the most appropriate one that helps in getting the relevant information. There is no one best research design for all situations.

7. Data Collection, Data Processing, and Analysis

Data collection is integral part of the research design, though we are dealing it separately. Data collection is determined by the research technique selected for the project. Data can be collected in a variety of ways, in different settings – field or lab – and from different sources. It could include *interviews* – face to face interviews, telephone interviews, computer-assisted interviews, and interviews through electronic media; *questionnaires* that either personally administered, sent through mail, or electronically administered; *observation* of individuals and events which could be participant or non-participant.

Once the fieldwork has been completed, the data must be converted into a format that will answer the research questions and or help testing the hypotheses. Data processing generally begins with the editing and coding of the data. Editing involves checking the data collection forms for omissions, legibility, and consistency in classification. The editing process corrects problems such as interviewer errors prior to the data are transferred to a computer. Coding may be the assigning of numbers or symbols before it goes to the computer. The computer can help in making tables and the application of different statistics.

Analysis is the application of reasoning to understand and interpret the data that have been collected. The appropriate analytical technique is to be determined by the research design, and the nature of the data collected

8. Testing the Hypotheses; Answering the Research Questions

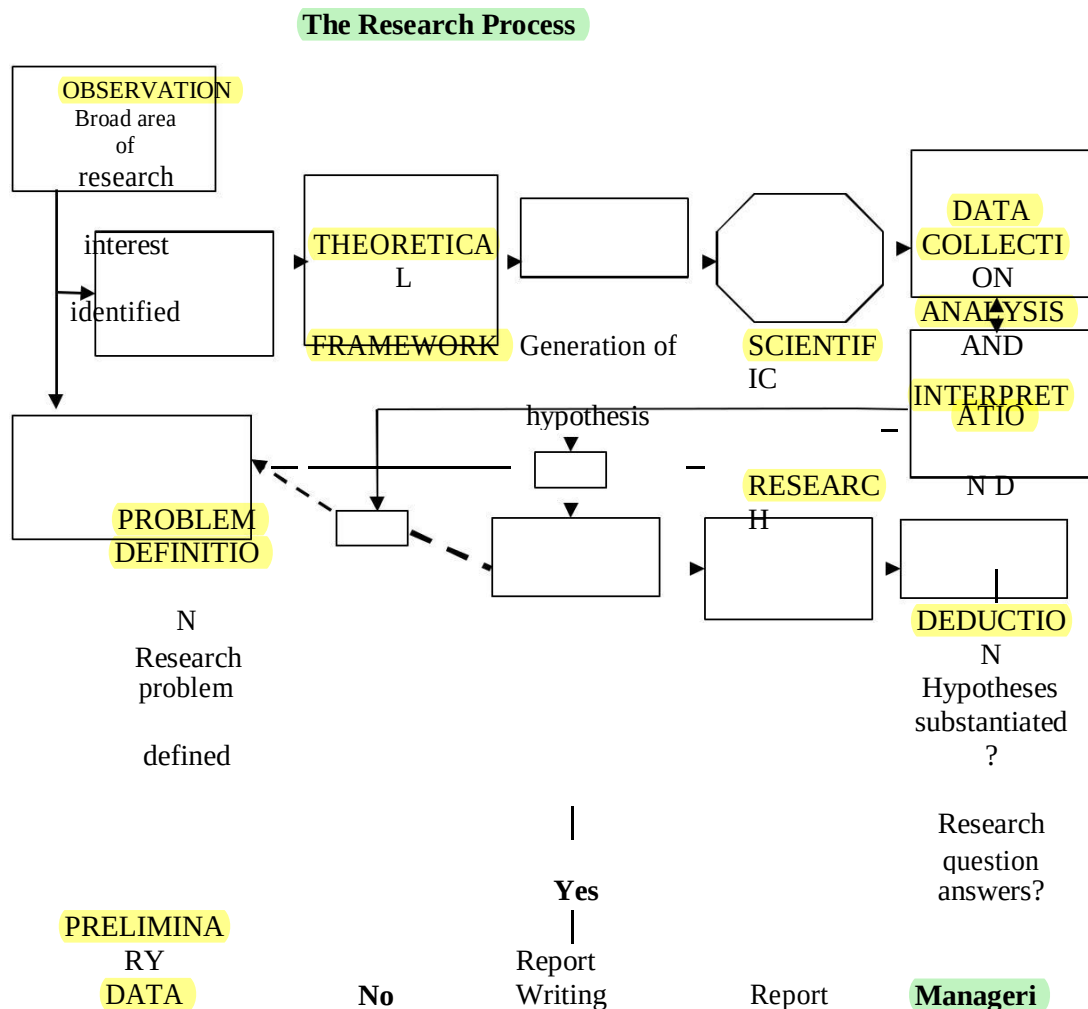
The analysis and interpretation of the data shall be the means to testing the formulated hypotheses as well as finding answers to the research questions. In case of applied research, the research should be helpful in finding solutions to the problems of the organization or society. Making recommendations may also be part of this process.

9. Report Writing

The research report should communicate the research findings effectively. All too often the report is a complicated statement of the study's technical aspects and sophisticated research methods. If the study has been conducted for a business management, often the management is not interested in detailed reporting of the research design and statistical findings but wants only the summary of the findings. Research is only as good as the applications made of it. Nevertheless, the research report becomes a historical document, a record that may be referred to in later studies. In case of research for academic purposes, the research findings become part of the body of knowledge, and the research may be producing research papers for publication in professional journals.

The report has to be presented in the format as it may have been part of the terms of reference if it is a sponsored study. In case of a dissertation the Universities have some standardized styles, which have to be followed. Similarly, the research papers have to be prepared in accordance with the format specified by the professional journals.

The graphic presentation of the research process may be like this:



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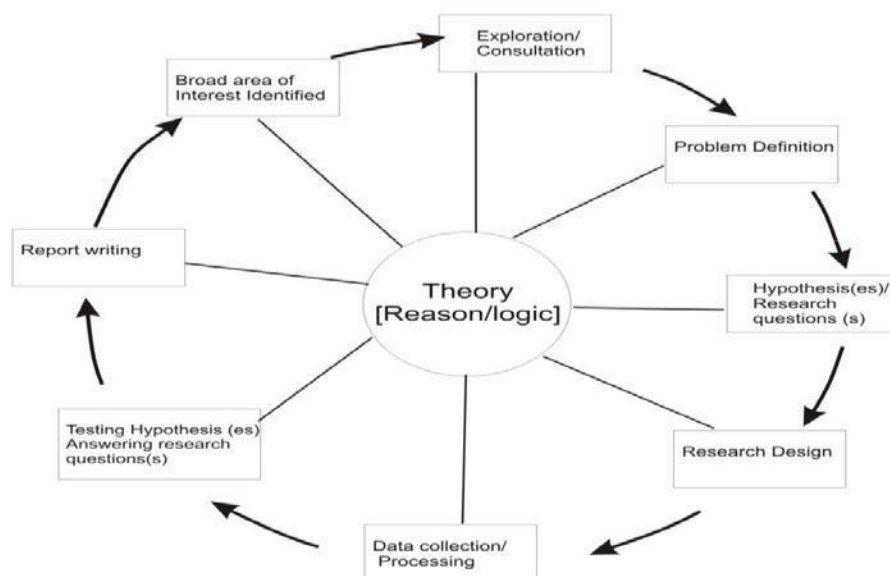
Interviewing
Literature
survey

— presentation —

al

Decision**Making**

STEPS IN SOCIOLOGICAL INVESTIGATION



LESSON 7

TOPIC SELECTION

Selecting the topic

Research problem has to have some title (topic). There is no formula for the selection of topic. Researcher has freedom of interest to select a research topic. Interest emerges from a variety of sources, some are mentioned below:

- Personal experiences.
- Mass media.
- Developments in knowledge.
- Solving problems (Org., family).
- Hot issues of daily life.

Start with a broad area of interest. Don't try to solve all the problems in one project. Make it doable and manageable so narrow it. At the end, you have something specific (definitive) to say. Not broadly based things. For example: within the broad area identify variables of interest (brainstorming, review of literature). Some possible variables are given below:

Power relations, organizational citizenship behavior, motivation, customer satisfaction, customer loyalty, aggressive behavior, modernism, religiosity, leadership, women empowerment, women harassment, self concept, job enrichment, emotional intelligence, emotional labor, occupational aspirations, conflict management, stress, organizational commitment, corporate social responsibility, marketing social responsibility, corporate voluntarism, super market loyalty schemes and customer retention, mobile hand-held devices, work-life balance.

Some guidelines for topic selection:

- Freedom to select a topic may be frustrating.
- Interest. Limit it to the field of study. Gender studies. Locate a specialized index related to field.
- Review the literature:
- - Skim the headings till the one catches your interest.
- - Focus on current research in your field. Any controversies. What more you would like to know? Brainstorm.
- From broad area of interest to a narrow topic.

Narrow it to:

- Focal question you want to answer. Where to go? If you know where to go then you can ask for its direction.
- Not a question for interview protocol.
- Research questions determine what is to be included and what is to be excluded.
- Therefore:

From a narrowed topic to question (s)

- Find in the topic the question (s) to be answered. Something which you do not know but feel you must.
- Why these questions are important? I am studying X because I want to find out who/ what/ when/ where/ why/ how _____
- Motivating question → transform the question of your interest that makes others interested in it. Question with a rationale.

From questions to problems

- Topic: I am studying harassment of women. Call it an educational problem. (you may convert it into a research problem)
- Research Questions: What is the profile of women experiencing harassment? What could be the determinants of harassment? What could be its consequences? How could we overcome it?
- Rationale: could be different for each question. Usefulness of what we do not know.

From problem to research problem:

- Practical problem. For solution pose research question (s). Incomplete knowledge or flawed understanding will need research. Will result in research problem.
- Research problem: Involves what we don't know. Non availability of answer (s) to the research question (s) can be a problem for research. Learn more, create knowledge.
- Solving research problem *per se* does not solve the practical problem. Have to apply the research findings.

Epistemological considerations

- Research to create knowledge.
- Knowledge that is acceptable in a discipline.
- Acceptability based on grounds and nature of the knowledge itself. Epistemology.
- Nature of knowledge: natural science, social science.
- How to acquire that knowledge? Basis → means for acquiring knowledge. Strategies of research.

Natural science epistemology

- Positivism: scientific strategy to study the phenomenon based on five principles:
- 1. Sensory experiences: Knowledge confirmed by the senses (principle of phenomenalism).
- 2. Theory to generate hypotheses to be tested thereby provide explanations of laws (principle of deductivism).
- 3. Knowledge arrived at through gathering of facts that provide the basis for laws (inductivism).
- 4. Scientific strategy has to be value free (objectivity).
- 5. Scientific findings (statements) can be verified. Normative statements or beliefs cannot be confirmed

Positivism in social sciences

- Application of natural science model to social reality.
- Reality out there. External to the observer.
- Positivism equated with science. Tangled.
- Debate. Opposing positivism or scientific approach
- Subject matter of the natural sciences different from the social sciences.
- Difficulty to apply the natural science model to SS.

Interpretivism

- Explanation of human behavior (positivism) vs. understanding of human behavior (interpretivism).
- Understanding (Weber's use of *Verstehen*).
- Emphatic understanding. Interpretive understanding of social action.
- Subjective meaning of social action.
- Such approach is also called phenomenology.
- Alfred Schutz associated with it.
- How individuals make sense of the world around them? Based on subjective interpretation.

Interpretivism (cont.)

- Three main features:
- 1. Reality (social + physical) has meaning for humans. Common sense thinking. Act. Meaning to own and others acts. Interactions. All based on interpretation.
- 2. Social scientist has to gain access to people's 'common sense thinking' and hence to interpret their actions and their social world from their point of view.
- 3. Researcher's interpretation of the humans interpretation + Interpreted in terms of concepts, theories, and literature of the discipline. Use social scientific frame. (double interpretation)

Epistemologically

- Can natural science approach (positivism) be applied to social science world? Quantitative + Deductive approach. Theory and research.
- Can the interpretivist approach be a substitute? Qualitative + inductive approach. Research and theory.
- Theory and research compliment each other.

Ontological considerations

- Concerned with the nature of social entities.
- Can social entities be considered as objective entities?
- Can these social entities be realities external to social actors?
- Who constructed these realities? Actors? Researchers?
- Two ontological positions: Objectivism and constructionism.
- Are these poles apart? Ideal types.

Objectivism

- Social phenomena and their meaning have an existence external (independent) of actors.

- Organization as tangible object: rules and regulations, TQM, meritocracy, bureaucracy, culture. A reality external to workers. Employees perform in line with some set pattern. Organization components outside the employees. Putting constraints on workers.
- Ideally it is assumed that workers in the organization have no role in the creation of organization and its culture.

Constructionism

- Also called constructivism.
- Social phenomena and its meaning created and continuously being created by the people.
- Researchers' own accounts of the social world are also constructions. Specific version of reality. One version of knowledge.
- Organization and its culture created. Negotiation.
- Culture persists and antedates the participation of particular people. Shapes their perspectives.
- Categories of the reality are created. Masculinity.

Research strategy: General orientation →

quantitative vs. qualitative research

- Quantitative researches employ measurement.

	Quantitative	Qualitative
Role of theory to research	Deductive: theory testing	Inductive: theory generation
Epistemological orientation	Natural science model: positivism	Interpretivism
Ontological orientation	Objectivism	Constructionism

No wedge between the two

- Overtones of one over the other. Examples:
- Qualitative research used for testing theories rather than generating theories. (Adler and Adler 1985 study of relationship between participation in athletics and academic achievement. Used existing literature as proxy for theory.)
- Quantitative: Westergaard et.al. 1989 feeling of redundancy and job search. Interpretivist tone.
- Use mixed methods.

Influences on social research

- Epistemology
- Ontology
- Practical considerations
- Values – research not value free. Can intrude any /all steps.
- -- Choice of research area
- -- Formulation of research question
- -- Choice of method
- -- Formulation of research design
- -- Data collection
- -- Analysis of data
- -- Interpretation of data
- -- Conclusions

LESSON 8**REVIEWING LITERATURE**

In review of literature

- Researchers read other peoples' research.
- They learn, compare, replicate, and critically appreciate the work by others.

Skepticism

- Read critically. Skepticism is the norm of science. Don't accept simply because it is published. Evaluate.
- See whether introduction and the title fit with the rest of the article.
- Methods and results sections are the most critical.

How review will look like?

- Listing series of reports with a summary of each is not a review.
- In that case the review will look like a set of notes strung together.
- Organize common findings or arguments together.
- Address the most important ideas first, to logically link findings, and to note discrepancies.

Writing the introduction

- Define or identify the general topic, or issue of concern i.e. provide an appropriate context.
- Point out overall trends in what has been published about the topic. (conflicts in theory, methodology, evidence, and conclusions; or gaps in research and scholarship; new perspective of immediate interest).

Writing the introduction

- Define or identify the general topic, or issue of concern i.e. provide an appropriate context.
- Point out overall trends in what has been published about the topic. (conflicts in theory, methodology, evidence, and conclusions; or gaps in research and scholarship; new perspective of immediate interest).
- Establish your reason for review.
- Establish the criteria to be used in analyzing and comparing literature.
- Organization of the review (sequence).
- State why certain literature is or is not included (scope of review).

Writing the body

- Group the studies according to some common denominators (qualitative vs. quantitative, conclusions of authors, specific purpose/objective, chronology).
- Major studies are described in detail, while less important works may be in just a line or two.

- Refer to several studies that reported similar results in a single sentence [similar other smaller studies reported similar results (Adams, 1996; Brown, 2006; Davis, 2007)]
- Summarize individual studies with as much or as little detail in accordance with its comparative importance. Space or length denotes its significance.
- Provide the reader with strong “umbrella” sentences at beginnings of paragraph,
- “signposts” throughout, and
- Brief “so what” summary sentences at intermediate points showing the comparisons and analysis.
- Use evidence: the interpretation of the available sources must be backed up with evidence to show that what you are saying is valid.
- **Be selective: select only the most important points in the review. The type of information you choose to mention should relate directly to the review’s focus (theme, methodology, chronology).**
- Use quotes sparingly:
- Summarize and synthesize: Do it in each paragraph as well as through the review.
- Keep your own voice: though reviewing others “ideas”, your voice should remain front and center.
- Use caution when paraphrasing: be sure to represent the author’s information or opinions accurately and in your own words.
- Use terminology familiar to your audience:
- Double check that you have documented your sources.
- Bad sign to see every paragraph beginning with name of a researcher.
- Organize the review into sections that present themes or identify trends.
- Synthesize and evaluate the researches to the guiding concept of your thesis or research question.

Example: Why sexist language affects persuasion?

- However, other studies have shown that even gender-neutral antecedents are more likely to produce masculine images than feminine ones (Gastil, 1990). Hamilton (1998) asked students to complete sentences that required them to fill in pronouns that agreed with gender-neutral antecedents such as “writer,” “pedestrian,” “persons,” “director,” “manager,” “worker,” “laborer.”

Example: Why sexist language affects persuasion?

- However, other studies have shown that even gender-neutral antecedents are more likely to produce masculine images than feminine ones (Gastil, 1990). Hamilton (1998) asked students to complete sentences that required them to fill in pronouns that agreed with gender-neutral antecedents such as “writer,” “pedestrian,” “persons,” “director,” “manager,” “worker,” “laborer.”
- The students were asked to describe any image they have when writing the sentence. Hamilton found that people imagined 3.3 men to each woman in the masculine “generic”

condition and 1.5 men per woman in the unbiased condition. Thus while ambient sexism accounted for some of the masculine bias, sexist language amplified the effect.

Summarize the review in a table

- Keyway to help overview, organize, and summarize the findings
- Each must be accompanied by an analysis that interprets and synthesizes.
- Example:
- Definitions of terms and concepts
- Research methods used
- Summary of research results.

Writing the conclusion

- Summarize major contributions of significant studies to body of knowledge under review maintaining the focus established in the introduction.
- Evaluate the current body of knowledge reviewed pointing out:
- Major methodological flaws or gaps in research. Dominant approaches.
- Inconsistencies in theory and findings.
- Areas or issues pertinent to future study.
- Conclude by providing some insight into:
- The relationship between the central topic of literature review and a larger area of study such as discipline, profession.
- References: Follow appropriate format.
- Review may be spread over 3-6 pages.

Plagiarism

- In publications, presentations, writings the researchers explicitly identify, credit, and reference the author when they take data or material verbatim from another person's written work, whether it is published, unpublished, or electronically available.
- Ethics: Do not present others' work as your own. Acknowledge even the ideas that have been borrowed.

Ethics of research

- Ethical behavior pervades each step of the research process – data collection, data analysis, reporting, and dissemination of information

Lesson 10**Theoretical Framework and Hypothesis**

Theory and framework

A theory makes generalizations about observations and consists of an interrelated coherent set of ideas and models.

Theories are constructed in order to explain, predict and master (control) the phenomena (e.g. relationships, events, or behavior).

We are always constructing models of reality.

Theories not only imply the answers of some hypothesis but also, lead to the formulation of some others.

Theory

Theory provides a point of focus for attacking the unknown in a specific area

If a relationship is found between the two variables a theory should be formulated to explain why the relationship exists. Theories are purposely created and formulated, never discovered. They can be tested but never proven.

Theoretical Framework

Theoretical framework is analogous to the blueprint of a house. Frame Comparable to drawing and designing an architectural structure prior to house construction. The framework holds and supports the theory of a research work. It is abstract hence theoretical. Abstract and logical structure of meanings that guides the development of the study.

TF: A Rationale for Predictions

TF provides a rationale for predictions about the relationships among variables of research study. All frameworks are based on the identification of key concepts relevant to the topic and the relationships among those concepts. The overall purpose is to make research findings meaningful and generalizable. Theories and conceptual models help to stimulate research and the extension of knowledge by providing both direction and impetus.

Concept Reality

Conception of reality. Portrayal of image

Abstract description. Name given to an object or phenomenon. Name provides it with a separate identity and meaning. Constructs

An intellectual representation of some aspect of reality that is derived from observations made from phenomenon

Concepts are very high levels of abstraction that have general meaning. Meaning is constructed.

Examples: achievement, motivation, job satisfaction, OCB. All constructs.

Variable

A more concrete level of concept. Narrow in their definition.

A variable is relatively specific and measurable.

Framework can be derived from interrelationship of concepts (conceptual) or existing theories (theoretical).

Observation: Achievement motivation

Is achievement motivation a reality?

Observed phenomenon among workers, students

What is the conception of this reality? How has this reality been constructed?

Theoretically what explains this reality? Then Why is there variation in the levels of achievement motivation?

Built-in notion of measurability. Concept turns out to be a variable.

AchMotiv.: an observed reality

If we know the factors that explain the variation, then prediction about the level of achievement motivation can be made, and finally it may be controlled. Also

Achievement motivation can have effect on other realities just like OCB.

Now let us look at the reality of achievement motivation

Two words: 1. Achievement

Achievement: conception of this reality.

Intentional goal directed actions, acts of choice, vigorous struggle to get something.

One is clear about the goals. Has unambiguous knowledge about goals. What is to be evaluated?

Feels a person has the resources (knowledge, skills, stamina, time) to reach the goal.

Could be some degree of risk.

Level of achievement

Individuals desire for significant accomplishments, mastering skills, control, or attaining high standards.

To measure the level of achievement, it has to be evaluated. Evaluated performance. Compare over time. Compare with others (peers).

Motivation

What moves a person to act?

The force that energizes, directs, and sustains a person to perform an act. Reason or reasons

Internal process – impulse that arouses an organism to act to achieve a goal

Achievements of goals

Motivation to act to achieve goal

Need for power (over the job, the skills, the people, the resources □□ control)

Need for affiliation (with certain circles, management, membership with organizations, self concept)

Need for achievement (desire for significant accomplishments like competing peers, standards of excellence, status/recognition)

Level of motivation

Level of motivation to act depends upon:

The strengths of the needs,

Expectancy of success – reinforcements,

Incentive value of success (pay raises).

Or

Just for intrinsic reasons work is challenging; it is enjoyable; it challenges one's curiosity.

Achievement motivation framework

Is there an existing framework available? Does it suite you? If yes (there are lot of motivation frameworks readily available), select and elaborate.

If no, develop your own by:

Identifying the relevant variables;

Specifying the logical relationship between different variable leading to;

Formulating the propositions; and

Sequential arrangement of the propositions.

Need achievement relevant variables

Power over the job, the skills, the people, the resources , competing the peers

Affiliation with certain circles, with management, membership with organizations.

Achieving aspirations, desire for significant accomplishments, mastery of skills, social recognition, self concept, meeting standards of excellence.

Expectancy of success (reinforcement).

ncentive value of success (pay raises).

Specify the logical relationship

Competition with peers needs control over resources like the work force skills. Given the situation an advantage in work force skills can provide an edge over the competitors in terms of efficient achievement of the goals.

This is theorizing the relationship. Concluding propositions:

1. The more the competition with peers, the more the need for strengthening of work force skills.

2. The more the control over work force resource, the more the control on quality standards.

Another relationship

Achieving the quality standards in products and social recognition

Products evaluated by quality standards, upholding the standards of excellence provides recognition which in turn generates high selfconcept like the brand name.

The higher the upholding of standards of excellence the higher the recognition (status, selfconcept, brand name)

Another relationship

Social recognition and desire for affiliation with certain circles (individuals, groups, professional organizations). May be the highest need in Maslow's hierarchy of needs.

Affiliation itself reflective of further recognition and a drive towards the need for power, entry into decision making corridors of the profession.

Theorizes another proposition:

The higher the social recognition, higher the selfconcept, the greater the desire for affiliation.

Sequential arrangement of propositions: achievement motivation

1. The more the competition with peers, the more the need for strengthening of work force skills.

2. The more the control over work force resource, the more the control on quality standards.

3. The higher the upholding of standards of excellence, the higher the recognition (status, selfconcept, brand name)

4. The higher the social recognition, higher the selfconcept, the greater the desire for affiliation.

Hypothesis: Higher the achievement motivation the greater the effort to achieve the goals

Achievement motivation and OCBs

Antecedents of OCBs can be understood when OCBs are viewed as motive-based behaviors. Prior to that look at the:

Conception of OCB as a reality.

OCB has been presumed as a socially desirable reality element to the behaviors. Behaviors often defined in terms of “altruism” and other positive characteristics.

Conception of OCB as a reality

OCB an altruistic behavior. Desirable.

Promotes the effective functioning of the organization.

All discretionary: not directly or explicitly recognized by the formal reward system.

OCBs have context.

OCB also has motives

OCB are behaviors – actions that are clearly observable by fellow employees, supervisors, or researchers.

Are there motives behind acts?

OCB, like other behaviors, probably emerge from a motive.

OCB, like most behaviors, are determined by multiple factors.

OCB related factors

Helping others,

Commitment to serving others,

Communicating changes that affect others, • Refraining from complaining, and

Participating in unit meetings.

Can achievement-affiliation-power motive framework be applied to the concept of OCB?

Theoretical relationship

In the achievement motive model, OCB are exhibited as a means for task accomplishment. When achievement is the motive, OCB emerge because such behaviors are viewed as necessary for success in the task.

The “achievement-motivated citizen” views the job from a more holistic perspective.

The little things that make up OCB are not really viewed as outside one’s role, but rather keys to success

Achievement oriented considers helping another employee speeds up task performance,

Communicating with others brings immediate appreciation, and Participating in meetings directly contributes to better strategies.

When achievement is the motive, OCB emerge because such behaviors are viewed as necessary for success in the task.

Proposition: More the exhibition of OCB greater the chances for task accomplishment.

Exhibiting OCB is also likely to bring a strong degree of intrinsic satisfaction.

Theoretical relationship

Affiliation oriented person exhibits OCB as a means to establish and maintain relationships with people or the organization

Person with affiliation motive will express commitment to the people in the organization – coworkers, managers, and supervisors alike.

Acts of helping, communicating, cooperating, and participating all emerge from their desire to belong to and remain with the group.

Proposition: Greater the need for affiliation of a person, more the exhibition of OCB.

Theoretical relationship

Person with power-motive sees OCB as a means to acquire power and status with authority figures in the organization.

Proposition: Greater the commitment to self and one's own career agenda, greater the acts of OCB.

Person with power-motive provides help to others, or communicates across departments, or provides input into organizational processes in order to be visible to those in power roles.

Proposition: More the visibility of the “arena” surrounding the OCB greater the exhibition of OCB.

1. More the exhibition of OCB greater the chances for task accomplishment.

2. Greater the need for affiliation of a person, more the exhibition of OCB.

3. Greater the commitment to self and one's own career agenda, greater the acts of OCB.

4. More the visibility of the “arena” surrounding the OCB greater the exhibition of OCB.

Hypothesis: Higher the achievement-affiliation power motive greater the exhibition of OCB

Purposes of theoretical framework

To test the theories

To make research findings meaningful and generalizable.

To establish orderly connections between observations and facts.

To predict and control situations.

To stimulate research.

Frameworks represented as models

A model is symbolic representation that helps the researcher to express abstract concepts and relationships easily, using minimal words.

A model can be presented schematically or mathematically.

Schematic model conveys concepts and propositions through the use of boxes, arrows or other symbols.

Conceptual framework

This consists of concepts that are placed within a logical and sequential design.

Represents less formal structure and used for studies in which existing theory is inapplicable or insufficient.

Based on specific concepts and propositions, derived from empirical observations and intuition.

May deduce theories from a conceptual framework.

Purposes of conceptual framework

- To clarify concepts and propose relationships among the concepts in a study.
- To provide context for interpreting the study findings.
- To explain observations
- To encourage theory development that is useful to practice

Theoretical framework

- Theory provides a point of focus for attacking the unknown in a specific area
- If a relationship is found between the two variables a theory should be formulated to explain why the relationship exists.
- Theories are purposely created and formulated, never discovered.
- They can be tested but never proven.

Theoretical framework

Theory: an explanation of a phenomenon or an abstract generalization that systematically explains relationships among given phenomena.

The theoretical framework consists of theories that seem to be interrelated.

Theoretical framework

- The explanation concerns the relationship between two or more variables or phenomena.
- More formal and used for studies based on existing theories.
- Derived from specific concepts and propositions that are induced or deduced.

Importance of theory in research

- The function of theory in research is to identify the starting point of the research problem and to establish the vision to which the problem is directed
- It determines and defines the focus and goal of research problem.

Key terms to understand

Conceptualization: The process of forming basic ideas, designs, plans or strategies based on given facts, situations and examples.

Propositions: A statement or assertion of the relationship between concepts derived from theories or generalizations based on empirical data.

Purposes of theoretical framework

- To test the theories
- To make research findings meaningful and generalizable.
- To establish orderly connections between observations and facts.

To predict and control situations.
To stimulate research.

Conceptual paradigm

A diagram that visually represents and interprets the underlying theory, principles, and concepts of research.

A visual presentation of variables that interrelate with one another and perceived by the researcher before an actual empirical investigation is done to prove its relationship.

Formulating theoretical framework

Authoritative theories must be presented

Identify the important concepts/variables

Identify the relationships between the variables

Through the literature review provide theoretical rationale for the proposed relationships.

Assumptions

Are the statements related to the problem.

Provide a basis to develop theories.

Influence the development and implement the research process. But

Statements that are often taken for granted or considered true, even though they have not been scientifically tested.

Principles that are accepted as being true based on logic or reasons but without proof and verification

How should the TF be written?

Introduction: provide an overview of the focus and objectives of the review, along with a thesis statement.

Critique of TF

Is the TF clearly identified?

Is the TF consistent with what is being studied?

Are the concepts clearly and operationally defined?

Do they reflect the area of investigation?

Was sufficient literature reviewed to support the proposed relationship?

Is the theoretical basis for hypothesis formulation clearly articulated?

Is it logical?

Are the relationships among propositions clearly defined?

LESSON 11**OPERATIONALIZATION OF VARIABLES****Measurement:**

In quantitative research designing precise ways to measure variables is vital step at the planning stage. 

Develop techniques that can produce quantitative data. Move from abstract ideas to produce precise numerical information.

Contemplate and reflect on concepts prior to the gathering of data.

Qualitative researchers mostly do it during data collection.

Operationalization

Process of measurement of the variable.

The process of moving from theoretical definition of the variable to specific activities or measures that allow the researcher to observe it empirically.

Operational definition

Definition of the variable in terms of the specific actions to identify as well as to measure empirically.

Steps in operationalization

Specify the variable

Variable: Achievement motivation

Though focus is on motivation still let us look at its context i.e. achievement

Achievement: Intentional goal directed actions.

Substitute goals with needs. Then it is intentional need directed actions. Behaviors

Specifically it comes to nAchievement.

nAchievement

Could be looked at from different angles. Could have different indicators. Call these as dimensions.

Dimensions are the different angles (aspects) of the variable that could be used to identify the variable.

Dimensions of Achievement

Three dimensions (McClelland):

1. Need for power. Achieving control over various units of interest (resources, people) to the individual.
2. Need for affiliation. Achieving association with individuals, groups, and organizations.
3. Need for achievement. Attaining standard of excellence, seeking the accomplishment of a task, challenge, or competition.

Elements of dimensions

Breaking each dimension further into actual patterns of behavior that would be exhibited

Need for power: control over the job, the skills, the people, the resources.

Need for affiliation: achieving association with certain circles, with management, membership with organizations.

Need for achievement: attaining standard of excellence, accomplishment of tasks, meeting challenges, fighting competition.

Achievement Motivation

Theoretically motivation is the force that energizes, directs, and sustains a person to perform an act.

Achievement motivation is an urge that arouses an organism to act to the achievement of needs.

How strong is the urge?

The strength of needs to be achieved determines the strength of urge (motivation). Hypothesis.

Strength of each of the three needs could vary.

Over all level of strength is likely to determine the level of achievement motivation

Operationalization of achievement motivation

Theoretically motivation is an urge in the organism displayed through its behavior.

Indicators of this urge portrayed in the behavior.

Reduce the abstraction to observable behavior. Dimensions.

Review of literature provides an inventory of more than 17 dimensions of job related achievement motivation.

Let us look at some of these.

Some commonly used dimensions and elements of achievement motivation

Dimension 1. Engagement: Desire to be regularly engaged in job related activity. Place high priority on work. “Workaholics” neglecting aspects of personal life.

Elements of dimension 1

Such person will be:

i. Always at work

ii. Reluctant to take time off from work • iii. Persevere (even in face of some setbacks).

Busy in work related activities.

Work drives in office, after office, even at home.

How frequently people take time off from their job?

Statements like:

I am reluctant to take time off from work.

I keep trying for achieving the goals despite setbacks.

It is very difficult for me to continue to do work in case of initial failures.

I am very disappointed if I do not achieve the goal I had set for myself.

Dimension 2. Unable to relax

Persons are unable to direct their attention to other than work related activity.

Elements of dimension 2

Those who are able to relax don't think of work/work place. So they don't relax.

The person continues thinking about work while away from work place.

The person has no time to pursue hobbies.

How is the time spent when away from place of work?

Statements like:

I often neglect my personal matters because I am preoccupied with my job.

I often think of my work when I am at home.

Dimension 3. Impatience with ineffectiveness.

Tendency to take responsibility for one's own actions. Perseverance.

Prefer to work on their own rather than with slow workers..

Elements of dimension 3

No patience with ineffective people.

Work alone

Statements like:

I push myself to get the job done on time.

I prefer to work alone than with others.

Being part of team is less important for me than doing good work on my own.

I am very disappointed if I do not achieve the goal I had set for myself.

Dimension 4. Preference for challenging jobs

Seek out challenging rather than easy tasks.

Seek out greater challenges once difficult task completed.

Difficult task with moderate risk of failure.

Elements of dimension 4

Preference for challenging jobs. No routine jobs.

Be realistic: neither too challenging nor low challenging. Moderate challenges

Statements like:

I like situations, in which I can find out how capable I am
 I enjoy situations, in which I can make use of my abilities.
 I am attracted by tasks, in which I can test my abilities.
 I prefer to work on challenging jobs.
 I compete with others for the achievement of my goals.

Dimension 5. Seeking feedback

Like to know how they were progressing.
 Like to get feedback from their superiors, colleagues, and even juniors.

Elements of dimension 5

Feedback (positive/negative) on their work.
 Feedback used for improving achievement, mastery of skills, control on others.

Statements like:

I always look for feedback from others.
 I am disappointed if others do not give me feedback on my work.

Make statements

Measure the level of achievement motivation by making statements.
 Put the responses on Likert scale (could be 5 point scale).
 See examples of statements on variety of dimensions even beyond what we discussed.

Statements						
No	Statements	S. Agree	Agree	Undecided	Disagree	S. Disagree
1	I like situations, in which I can find out how capable I am					
2	I enjoy situations, in which I can make use of my abilities.					
3	I am appealed by situations allowing me to test my abilities.					
4	I am attracted by tasks, in which I can test my abilities.					
5	I feel uneasy to do something if I am not sure of succeeding.					
6	Even if nobody would notice my failure, I'm afraid of tasks, which I'm not able to solve					
7	If I do not understand a problem immediately I start feeling anxious.					
8	I push myself to get the job done on time.					

No	Statements	S. Agree	Agree	Undecided	Disagree	S. Disagree
9	It is very difficult for me to continue to do work in case of initial failures.					
10	I often neglect my personal matters because I am preoccupied with my job.					
11	I often think of my work when I am at home.					
12	I am very disappointed if I do not achieve the goal I had set for myself.					
13	I am very focused on achieving my goals.					
14	I am unhappy if I make mistakes.					
15	I prefer to work alone than with others.					
16	I prefer to work on challenging jobs.					

No	Statements	S. Agree	Agree	Undecided	Disagree	S. Disagree
17	I don't mind taking up difficult tasks.					
18	I always look for feedback from my seniors.					
19	I welcome comments on my work from my co-workers.					
20	I am disappointed if others do not give me feedback on my work.					
21	I like taking risks.					
22	I compete with others for the achievement of my goals.					
23	I don't have time for any hobbies.					
24	Being part of team is less important for me than doing good work on my own.					
25	I look for achieving standards of excellence.					
26	I am sure that I will get affiliation with my professional organization.					

Lesson 12

SAMPLE AND SAMPLING TERMINOLOGY

A **sample** is a subset, or some part, of a larger whole. A larger whole could be anything out of which sample is taken. That 'whole' could be a bucket of water, a bag of sugar, a group of organizations, a group of students, a group of customers, or a group mid-level managers in an organization. A complete group of entities sharing some common set of characteristics is population. In other words, the totality out of which sample is drawn is referred to as **population**.

Why sample?**1. Saves Cost, Labor, and Time**

Applied research projects usually have budget and time constraints. Since sample can save financial cost as well as time, therefore, to go for sample study is pragmatic.

Of course, a researcher investigating a population with an extremely small number of population elements may elect to conduct a study on the total population rather than a sample because cost, labor, and time constraints are relatively insignificant.

Although sample study cuts costs, reduces labor requirements, and gathers vital information quickly, yet there could be other reasons.

2. Quality Management/supervision

Professional fieldworkers are a scarce commodity. In a large study, rather than employing less qualified staff it may be advisable to do a sample study and employ highly qualified professional fieldworkers. It can certainly affect the quality of the study. At the same time, it may be easier to manage a small group and produce quality information. Supervision, record keeping, training, and so forth would all be more difficult in a very large study.

3. Accurate and Reliable Results

Another major reason for sampling is that samples, if properly selected, are sufficiently accurate in most of the cases. If the elements of a population are quite similar, only a small sample is necessary to accurately portray the characteristics of interest. Most of us have had blood samples taken from the finger, the arm, or another part of body. The assumption is that blood is sufficiently similar throughout the body, the characteristics of the blood can be determined on the basis of sample.

When the elements of population are highly homogenous, samples are highly representative of the population. Under these circumstances almost any sample is as good as another.

Samples may be more accurate than census. In a census study of large population there is a greater likelihood of non-sampling errors. In a survey, mistakes may occur that are unrelated to the selection of people in the study. For example, a response may be coded incorrectly, or the keyboard operator might make data entry error. Interviewer mistakes, tabulation errors, and other non-sampling errors may

increase during census because of the increased volume of work. In sample, increased accuracy is

possible because the fieldwork and tabulation of the data can be closely supervised than would be possible in a census. In field survey, a small, well trained, closely supervised group may do a more careful and accurate job of collecting information than a large group of nonprofessional interviewers trying to contact everyone.

4. Sampling may be the Only Way

Many research projects, especially those in quality control testing, require the destruction of the items being tested. If the manufacturer of firecrackers wished to find out whether each product met a specific production standard, there would be no product left after testing. Similarly, consider the case of electric

bulbs. In testing the life of bulbs, if we were to burn every bulb produced, there would be none left to sell. This is destructive sampling.

5. Determine the Period of Study

Interviewing every element of a large population without sampling requires lot of time, may be a year or more. In such a long period study, even the seasonal variation may influence the response pattern of the respondents. For example, if the study was aimed at measuring the level of unemployment in a given large city, the unemployment rate produced by the survey data would not refer to the city as of the beginning of interviewing or as of the end. Researcher may be forced to attribute the unemployment to some hypothetical date, representing to the midpoint of the study period. Hence it will be difficult to determine the exact timing to which the data of the study pertains.

Sampling Terminology

There are a number of technical terms used in books on research and statistics which need explanation. Some of the important terms are:

Element

An element is that unit about which information is collected and which provides the basis of analysis. Typically, in survey research, elements are people or certain types of people. It is that unit about which information is collected and that provides the basis of analysis. It can be a person, groups, families, organizations, corporations, communities, and so forth.

Population

A population is the theoretically specified aggregation of study elements. It is translating the abstract concept into workable concept. For example, let us look at the study of “college students.” Theoretically who are the college students? They might include students registered in government colleges and/or private colleges, students of intermediate classes and/or graduate classes, students of professional colleges and/or non-professional colleges, and many other variations. In this way, the pool of all available elements is population.

Target Population

Out of the conceptual variations what exactly the researcher wants to focus on. This may also be called a target population. Target population is the complete group of specific population elements relevant to the research project. Target population may also be called *survey population* i.e. that aggregation of elements from which the survey sample is actually selected.

At the outset of the sampling process, it is vitally important to carefully define the target population so the proper source from which the data are to be collected can be identified. In our example of ‘college students’ finally we may decide to study the college students from government institutions located in Lahore, who are studying social sciences, who are aged 19 years of age, and hailing from rural areas.

Sampling

The process of using a small number of items or parts of a larger population to make conclusions about the whole population. It enables the researchers to estimate unknown characteristics of the population.

Sampling Frame

In actual practice the sample will be drawn from a list of population elements that is often different from the target population that has been defined. A sampling frame is the list of elements from which the sample may be drawn. A simple example could be listing of all college students meeting the criteria of target population and who are enrolled on the specified date.

A sampling frame is also called the *working population* because it provides the list that can be worked with operationally. In our example, such a list could be prepared with help of the staff of the selected colleges.

Sampling Frame Error

A sampling frame error occurs when certain sample elements are excluded or when the entire population is not accurately represented in the sampling frame. The error that occurs when certain sample elements are not listed or available and are not represented in the sampling frame.

Sampling Unit

A sampling unit is that element or set of elements considered for selection in some stage of sampling. Sampling may be done in single stage or in multiple stages. In a simple, single-stage sample, the sampling units are the same as the elements. In more complex samples, however, different levels of sampling units may be employed. For example, a researcher may select a sample of *Mohallahs* in a city, and then select a sample of households from the selected *Mohallahs*, and finally may select a sample of adults from the selected households. The sampling units of these three stages of sampling are respectively *Mohallah*, households, and adults, of which the last of these are the elements. More specifically, the terms “primary sampling units,” “secondary sampling units,” and “final sampling units” would be used to designate the successive stages.

Observation Unit

An observation unit, or unit of data collection, is an element or aggregation of elements from which the information is collected. Often the unit of analysis and unit of observation are the same – the individual person – but this need not be the case. Thus, the researcher may interview heads of household (the observation units) to collect information about every member of the household (the unit of analysis).

Parameter

A parameter is the summary description of a given variable in a population. The mean income of all families in a city and the age distribution of the city’s population are parameters. An important part portion of survey research involves the estimation of population parameters on the basis of sample observation.

Statistic

A statistic is the summary description of a given variable in a survey sample. Thus, the mean income computed from the survey sample and the age distribution of that sample are statistics. Sample statistics are used to make estimates of the population parameters.

Sampling Error

Probability sampling methods seldom, if ever, provide statistics exactly equal to the parameters that they are used to estimate. Probability theory, however, permits us to estimate the error to be expected for a given sample (more information to be sought from professional in Statistics).

Lesson 13

PROBABILITY AND NON – PROBABILITY SAMPLING

There are several alternative ways of taking a sample. The major alternative sampling plans may be grouped into probability techniques and non- probability techniques. In **probability sampling** every element in the population has a *known nonzero probability* of selection. The simple random is the best-known probability sample, in which each member of the population has an equal probability of being selected. Probability sampling designs are used when the representativeness of the sample is of importance in the interest of wider generalizability. When time or other factors, rather than generalizability, become critical, non-probability sampling is generally used.

In non-probability sampling the probability of any particular element of the population being chosen is unknown. The selection of units in non-probability sampling is quite arbitrary, as researchers rely **heavily on personal judgment**. It should be noted that there are no appropriate statistical techniques for measuring random sampling error from a non-probability sample. Thus, projecting the data beyond the sample is statistically inappropriate. Nevertheless, there are occasions when non-probability samples are best suited for the researcher's purpose.

Types of non-probability sampling:

In non-probability sampling designs, the elements in the population do not have any probabilities attached to their-being chosen as sample subjects. This means that the findings from the study of the sample cannot be confidently generalized to the population. However, the researchers may at times be less concerned about generalizability than obtaining some preliminary information in a quick and inexpensive way. Sometimes non-probability could be the only way to collect the data.

Convenience Sampling

Convenience sampling (also called *haphazard or accidental sampling*) refers to sampling by obtaining units or people who are most conveniently available. For example, it may be convenient and economical to sample employees in companies in a nearby area, sample from a pool of friends and neighbors. The person-on-the street interview conducted by TV programs is another example. TV interviewers go on the street with camera and microphone to talk to few people who are convenient to interview. The people walking past a TV studio in the middle of the day do not represent everyone (homemakers, people in the rural areas). Likewise, TV interviewers select people who look “normal” to them and avoid people who are unattractive, poor, very old, or inarticulate.

Another example of haphazard sample is that of a newspaper that asks the readers to clip a questionnaire from the paper and mail it in. Not everyone reads the newspaper, has an interest in the topic, or will take the time to cut out the questionnaire, and mail it. Some will, and the number who do so may seem large, but the sample cannot be used to generalize accurately to the population.

Convenience samples are least reliable but normally the cheapest and easiest to conduct. Convenience sampling is most often used during the exploratory phase of a research project and is perhaps the best way of getting some basic information quickly and efficiently. Often such sample is taken to test ideas or even to gain ideas about a subject of interest.

Purposive Sampling

Depending upon the type of topic, the researcher lays down the criteria for the subjects to be included in the sample. Whoever meets that criteria could be selected in the sample. The researcher might select such cases or might provide the criteria to somebody else and leave it to his/her judgment for the actual selection of the subjects. That is why such a sample is also called as **judgmental or expert opinion sample**. For example, a researcher is interested in studying students who are enrolled in a course on research methods, are highly regular, are frequent participants in the class discussions, and often come with new ideas. The criteria have been laid down, the researcher may do this job

himself/herself, or may ask the teacher of this class to select the students by using the said criteria. In the latter situation, we are leaving it to the judgment of the teacher to select the subjects. Similarly, we can give some criteria to the fieldworkers and leave it to their judgment to select the subjects accordingly. In a study of working women, the researcher may lay down the criteria like: the lady is married, has two children, one of her child is school going age, and is living in nuclear family.

Quota Sampling

A sampling procedure that ensures that certain characteristics of a population sample will be represented to the exact extent that the researcher desires. In this case the researcher first identifies relevant categories of people (e.g. male and female; or under age 30, ages 30 to 60, over 60, etc) then decides how many to get in each category. Thus, the number of people in various categories of sample is fixed. For example, the researcher decides to select 5 males and 5 females under age 30, 10 males and 10 females aged 30 to 60, and 5 males and 5 females over age 60 for a 40-person sample. This is quota sampling.

Once the quota has been fixed then the researcher may use convenience sampling. The convenience sampling may introduce **bias**. For example, the field worker might select the individual according to his/her liking, who can easily be contacted, willing to be interviewed, and belong to middle class.

Quota sampling can be considered as a form of proportionate stratified sampling, in which a predetermined proportion of people are sampled from different groups, but on a convenience basis. Speed of data collection, lower costs, and convenience are the major advantages of quota sampling compared to probability sampling. Quota sampling becomes necessary when a subset of a population is underrepresented, and may not get any representation if equal opportunity is provided to each. Although there are many problems with quota sampling, careful supervision of the data collection may provide a representative sample of the various subgroups within the population.

Snowball Sampling

Snowball sampling (also called *network*, *chain referral*, or *reputational sampling*) is a method for identifying and sampling (or selecting) cases in the network. It is based on an analogy to a snowball, which begins small but becomes larger as it is rolled on wet snow and picks up additional snow. It begins with one or a few people or cases and spreads out on the basis of links to the initial cases.

This design has been found quite useful where respondents are difficult to identify and are best located through referral networks. In the initial stage of snowball sampling, individuals are discovered and may or may not be selected through probability methods. This group is then used to locate others who possess similar characteristics and who, in turn, identify others. The “snowball” gather subjects as it rolls along.

For example, a researcher examines friendship networks among teenagers in a community. He or she begins with three teenagers who do not know each other. Each teen names four close friends. The researcher then goes to the four friends and asks each to name four close friends, then goes to those four and does the same thing again, and so forth. Before long, a large number of people are involved. Each person in the sample is directly or indirectly tied to the original teenagers, and several people may have named the same person. The researcher eventually stops, either because no new names are given, indicating a closed network, or because the network is so large that it is at the limit of what he or she can study.

Sequential Sampling

Sequential sampling is similar to purposive sampling with one difference. In purposive sampling, the researcher tries to find as many relevant cases as possible, until time, financial resources, or his or her energy is exhausted. The principle is to get every possible case. In sequential sampling, a researcher continues to gather cases until the amount of new information or diversity is filled. The principle is to gather cases until a saturation point is reached. In economic terms, information is gathered, or the incremental benefit for additional cases, levels off or drops significantly. It requires that the researcher

continuously evaluates all the collected cases. For example, a researcher locates and plans in-depth interviews with 60 widows over 70 years old who have been living without a spouse for 10 or more years. Depending on the researcher's purposes, getting an additional 20 widows whose life experiences, social background, and worldview differ little from the first 60 may be unnecessary.

Theoretical Sampling

In theoretical sampling, what the researcher is sampling (e.g. people, situation, events, time periods, etc.) is carefully selected, as the researcher develops grounded theory. A growing theoretical interest guides the selection of sample cases. The researcher selects cases based on new insights they may provide. For example, a field researcher may be observing a site and a group of people during week days. Theoretically, the researcher may question whether the people act the same at other times or when other aspects of site change. He or she could then sample other time periods (e.g. nights and weekends) to get more full picture and learn whether important conditions are the same.

Lesson 14**TYPES OF PROBABILITY SAMPLING**

Probability samples that rely on random processes require more work than nonrandom ones. A researcher must identify specific sampling elements (e.g. persons) to include in the sample. For example, if conducting a telephone survey, the researcher needs to try to reach the specific sampled person, by calling back several times, to get an accurate sample.

Random samples are most likely to yield a sample that truly represents the population. In addition, random sampling lets a researcher statistically calculate the relationship between the sample and the population – that is the size of *sampling error*. A non-statistical definition of the sampling error is the deviation between sample result and a population parameter due to random process.

Simple Random Sample

The simple random sample is both the easiest random sample to understand and the one on which other types are modeled. In simple random sampling, a research develops an accurate sampling frame, selects elements from sampling frame according to mathematically random procedure, then locates the exact element that was selected for inclusion in the sample.

After numbering all elements in a sampling frame, the researcher uses a list of random numbers to decide which elements to select. He or she needs as many random numbers as there are elements to be sampled: for example, for a sample of 100, 100 random numbers are needed. The researcher can get random numbers from a random number table, a table of numbers chosen in a mathematically random way. Random-number tables are available in most statistics and research methods books. The numbers are generated by a pure random process so that any number has an equal probability of appearing in any position. Computer programs can also produce lists of random number.

A random starting point should be selected at the outset.

Random sampling does not guarantee that every random sample perfectly represents the population. Instead, it means that most random samples will be close to the population most of the time, and that one can calculate the probability of a particular sample being inaccurate. A researcher estimates the chance that a particular sample is off or unrepresentative by using information from the sample to estimate the sampling distribution. The sampling distribution is the key idea that lets a researcher calculate sampling error and confidence interval.

Systematic Random Sample

Systematic random sampling is simple random sampling with a short cut for random selection. Again, the first step is to number each element in the sampling frame. Instead of using a list of random numbers, researcher calculates a *sampling interval*, and the interval becomes his or her own quasi random selection method. The sampling interval (i.e. 1 in K where K is some number) tells the researcher how to select elements from a sampling frame by skipping elements in the frame before one for the sample.

Sampling intervals are easy to compute. We need the sample size and the population size. You can think of the sample interval as the inverse of the sampling ratio. The sampling ratio for 300 names out of 900 will be $300/900 = .333 = 33.3$ percent. The sampling interval is $900/300 = 3$

Begin with a random start. The easiest way to do this is to point blindly at a number from those from the beginning that are likely to be part of the sampling interval.

When the elements are organized in some kind of cycle or pattern, the systematic sampling will not give a representative sample.

Stratified Random Sample

When the population is heterogeneous, the use of simple random sample may not produce representative sample. Some of the bigger strata may get over representation while some of the small ones may entirely be eliminated. Look at the variables that are likely to affect the results, and stratify the population in such a way that each stratum becomes homogeneous group within itself. Then draw the required sample by using the table of random numbers. Hence in stratified random sampling a sub-sample is drawn utilizing simple random sampling within each stratum. (Randomization is not done for quota sampling).

There are three reasons why a researcher chooses a stratified random sample: (1) to increase a sample's statistical efficiency, (2) to provide adequate data for analyzing the various subpopulations, and (3) to enable different research methods and procedures to be used in different strata.

1. Stratification is usually more efficient statistically than simple random sampling and at worst it is equal to it. With the ideal stratification, each stratum is homogeneous internally and heterogeneous with other strata. This might occur in a sample that includes members of several distinct ethnic groups. In this instance, stratification makes a pronounced improvement in statistical efficiency.

Stratified random sampling provides the assurance that the sample will accurately reflect the population on the basis of criterion or criteria used for stratification. This is a concern because occasionally simple random sampling yields a disproportionate number of one group or another, and the sample ends up being less representative than it could be.

Random sampling error will be reduced with the use of stratified random sampling. Because each group is internally homogeneous but there are comparative differences between groups. More technically, a smaller standard error may result from stratified sampling because the groups are adequately represented when strata are combined.

2. It is possible when the researcher wants to study the characteristics of a certain population subgroups. Thus, if one wishes to draw some conclusions about activities in different classes of student body, stratified sampling would be used.
3. Stratified sampling is also called for when different methods of data collection are applied in different parts of the population. This might occur when we survey company employees at the home office with one method but must use a different approach with employees scattered over the country.

Stratification Process

The ideal stratification would be based on the primary variable (the dependent variable) under study. The criterion is identified as an efficient basis for stratification. The criterion for stratification is that it is a characteristic of the population elements known to be related to the dependent variable or other variables of interest. The variable chosen should increase homogeneity within each stratum and increase heterogeneity between strata.

Next, for each separate subgroup or stratum, a list of population elements must be obtained. Serially number the elements within each stratum. Using a table of random numbers or some other device, a separate simple random sample is taken within each stratum. Of course, the researcher must determine how large a sample must be drawn from each stratum.

Proportionate versus Disproportionate

If the number of sampling units drawn from each stratum is in proportion to the relative population size of the stratum, the sample is proportionate stratified sampling. Sometime, however, a disproportionate stratified sample will be selected to ensure an adequate number of sampling units in every stratum.

In a disproportionate, sample size for each stratum is not allocated in proportion to the population size, but is dictated by analytical considerations.

Cluster Sampling

The purpose of cluster sampling is to sample economically while retaining the characteristics of a probability sample. Groups or chunks of elements that, ideally, would have heterogeneity among the members within each group are chosen for study in cluster sampling. This is in contrast to choosing some elements from the population as in simple random sampling, or stratifying and then choosing members from the strata, or choosing every n th case in the population in systematic sampling. When several groups with intra-group heterogeneity and inter-group homogeneity are found, then a random sampling of the clusters or groups can ideally be done and information gathered from each of the members in the randomly chosen clusters.

Cluster samples offer more heterogeneity within groups and more homogeneity among and homogeneity within each group and heterogeneity across groups.

Cluster sampling addresses two problems: researchers lack a good sampling frame for a dispersed population and the cost to reach a sampled element is very high. A cluster is unit that contains final sampling elements but can be treated temporarily as a sampling element itself. Researcher first samples clusters, each of which contains elements, then draws a second a second sample from within the clusters selected in the first stage of sampling. In other words, the researcher randomly samples clusters, and then randomly samples elements from within the selected clusters. He or she can create a good sampling frame of clusters, even if it is impossible to create one for sampling elements. Once the researcher gets a sample of clusters, creating a sampling frame for elements within each cluster becomes more manageable. A second advantage for geographically dispersed populations is that elements within each cluster are physically closer to each other. This may produce a savings in locating or reaching each element.

A researcher draws several samples in stages in cluster sampling. In a three- stage sample, stage 1 is random sampling of big clusters; stage 2 is random sampling of small clusters within each selected big cluster; and the last stage is sampling of elements from within the sampled within the sampled small clusters. First, one randomly samples the city blocks, then households within blocks, then individuals within households. This can also be an example of **multistage area sampling**.

The unit costs of cluster sampling are much lower than those of other probability sampling designs. However, cluster sampling exposes itself to greater biases at each stage of sampling.

Double Sampling

This plan is adopted when further information is needed from a subset of the group from which some information has already been collected for the same study. A sampling design where initially a sample is used in a study to collect some preliminary information of interest, and later a sub-sample of this **primary sample is used to examine the matter in more detail, is called double sampling.**

What is the Appropriate Sample Design?

A researcher who must make a decision concerning the most appropriate sample design for a specific project will identify a number of sampling criteria and evaluate the relative importance of each criterion before selecting a sample design. The most common criteria

Degree of Accuracy

Selecting a representative sample is, of course, important to all researchers. However, the error may vary from project to project, especially when cost saving or another benefit may be a trade-off for reduction in accuracy.

Resources

The costs associated with the different sampling techniques vary tremendously. If the researcher's financial and human resources are restricted, this limitation of resources will eliminate certain methods. For a graduate student working on a master's thesis, conducting a national survey is almost

always out of the question because of limited resources. Managers usually weigh the cost of research versus the value of information often will opt to save money by using non-probability sampling design rather than make the decision to conduct no research at all.

Advance Knowledge of the Population

Advance knowledge of population characteristics, such as the availability of lists of population members, is an important criterion. A lack of adequate list may automatically rule out any type of probability sampling.

National versus Local Project

Geographic proximity of population elements will influence sample design. When population elements are unequally distributed geographically, a cluster sampling may become more attractive.

Need for Statistical Analysis

The need for statistical projections based on the sample is often a criterion. Non-probability sampling techniques do not allow researcher to use statistical analysis to project the data beyond the sample.

Lesson 15

MEASUREMENT OF CONCEPTS

In everyday usage, measurement occurs when an established yardstick verifies the height, weight, or another feature of a physical object. How well you like a song, a painting, or the personality of a friend is also measurement. In a dictionary sense, to measure is to discover the extent, dimensions, quantity, or capacity of something, especially by comparison with a standard. We measure casually in daily life, but in research the requirements for measurement are rigorous.

Certain things lend themselves to easy measurement through the use of appropriate instruments, as for example, physiological phenomena pertaining to human beings such as blood pressure, pulse rates, and body temperature, as well as certain physical attributes such as height and weight. But when we get into the realm of people's subjective feelings, attitudes, ideology, deviance, and perceptions, the measurement of these factors or variables becomes difficult. Like the natural scientist who invents indirect measures of the "invisible" objects and forces of the physical world (magnetism – the force that moves a metal toward the magnet), the social researcher devises measures for difficult-to-observe aspects of the social world. For example, suppose you heard a principal complain about teacher morale in a school. Teacher morale is an empirical reality, and we can create some instrument for its measurement.

Measurement in Quantitative and Qualitative Research

Both qualitative and quantitative researchers use careful, systematic methods to gather high quality data. Yet, differences in the styles of research and the types of data mean they approach the measurement process differently. Designing precise ways to measure variables is a vital step in planning a study for quantitative researchers. Qualitative researchers use wider variety of techniques to measure and create new measures while collecting data. The two approaches to measurement have three distinctions.

One difference between the two styles involves timing. Quantitative researchers extensively think about variables and convert them into specific actions during a planning stage that occurs before and separate from gathering or analyzing data. Measurement for qualitative researchers occurs in the data collection process, and only a little occurs in a separate, planning stage prior to data gathering.

A second difference involves the data itself. Quantitative researchers want to develop techniques that can produce quantitative data (i.e. data in the form of numbers). Thus, the researcher moves from abstract ideas, or variables, to specific data collection techniques to precise numerical information produced by the techniques. The numerical information is an empirical representation of the abstract ideas. Data for qualitative researchers sometimes is in the form of numbers; more often it includes written or spoken word, actions, sounds, symbols, physical objects, or visual images. The qualitative researcher does not convert all observations into a single, common medium such as numbers. Instead he or she develops many flexible, ongoing processes to measure that leaves the data in various shapes, sizes, and forms.

All researchers combine ideas and data to analyze the social world. In both research styles, data are empirical representation of concepts, and measurement is a process that links data to concepts.

A third difference is how the two styles make such linkages. Quantitative researchers contemplate and reflect on concepts before they gather data. They construct measurement techniques that bridge concepts and data. The measurement techniques define what the data will be and are directions for gathering data.

Qualitative researchers also reflect on ideas before data collection, but they develop many, if not most, of their concepts during data collection activities. Researchers start gathering data and creating

ways to measure based what they encounter. As they gather data, they reflect on the process and develop new ideas. The ideas give them direction and suggest new ways to measure.

Here we shall focus on quantitative measurement. Here measurement consists of assigning numbers to empirical events in compliance with set rules. This definition implies that measurement is a three-part process:

1. Selecting observable empirical events.
2. Developing a set of mapping rules: a scheme for assigning numbers or symbols to represent aspects of the event being measured.
3. Applying the mapping rule(s) to each observation of that event.

Assume you are studying people who attend an auto show where all new models are on display introduced in a specific year. You are interested in learning the male-to female ratio among attendees. You observe those who enter the show area. If a person is female, you record an F; if male, an M. Any other symbols such as 0 and 1 may also be used if you know what group the symbol identifies.

Researchers might also want to measure the desirability of the styling of the new Espace van. They interview a sample of visitors and assign, with a different mapping rule, their opinions to the following scale:

What is your opinion of the styling of the Espace van?

Very desirable 5 _____ 4 _____ 3 _____ 2 _____ 1 Very undesirable

We can assign a weightage (score) like:

- 5 if it is very desirable
- 4 if desirable
- 3 if neither
- 2 if undesirable
- 1 if very undesirable.

All measurement theorists would call such opinion rating scale as a form of measurement.

What is measured?

Variable being studied in research may be classified as objects or as properties. **Objects** include the things of ordinary experience, such as tables, people, books, and automobiles. Objects also include things that are not as concrete, such as genes, attitudes, neutrons, and peer group pressures. **Properties** are the characteristics of the objects. A person's physical properties may be stated in terms of weight, height, and posture. Psychological properties include attitudes, intelligence, motivation, perceptions, etc. Social properties include leadership ability, class affiliation, or status. These and many other properties of an individual can be measured in a research study.

In a literal sense, researchers do not measure either objects or properties. They measure indicants of the properties or indicants of the properties of the objects. The properties like age, years of experience, and the number of calls made per week are easier to indicate and there is expected to be lot of agreement.

In contrast, it is not easy to measure properties like “motivation,” “ability to stand stress,” “problem-solving ability,” and “persuasiveness.” Since each property cannot be measured directly, one must infer its presence or absence by observing some indicant or pointer measurement. When you begin to make these inferences, there is often disagreement about how to operationalize the indicants.

The preceding discussion suggests two types of variables: one lends itself to objective and precise measurement; the other is more vague and does not lend itself to accurate measurement because of its subjective nature. However, despite the lack of physical measuring devices to measure the latter type, there are ways to tapping the subjective feelings and perceptions of individuals. One technique is to reduce the abstract notions, or concepts such as motivation, involvement, satisfaction, buyer behavior, stock market exuberance, and the like, to observable behavior and characteristics. In other words, the abstract notions are broken down into observable characteristic behavior. Reducing the abstract concepts to render them measurable in a tangible way is called operationalizing the concepts.

Parts of the Measurement Process

When a researcher measures, he or she takes a concept, idea, or construct and develops a measure (i.e. a technique, a process, a procedure) by which he or she can observe the idea empirically. Quantitative researchers primarily follow a deductive route. To begin with the abstract idea, follow with a measurement procedure, and end with empirical data that represent the ideas. Qualitative researchers primarily follow inductive route. They begin with empirical data, follow with abstract ideas, follow with processes relating with ideas and data, and end with a mixture of ideas and data.

Researchers use two processes: conceptualization and operationalization in measurement.

a. Conceptualization

Conceptualization is the process of taking a construct and refining it by giving it a conceptual or theoretical definition. A conceptual definition is definition in abstract, theoretical terms. It refers to other ideas or constructs. There is no magical way to turn a construct into a precise conceptual definition. It involves thinking carefully, observing directly, consulting with others, reading what others have said, and trying possible definitions.

A good definition has one clear, explicit, and specific meaning. There is no ambiguity or vagueness in the concepts (e.g. street gang, morale, motivation, social class, consumer satisfaction). A single construct can have several definitions, and people may disagree over definitions. Conceptual definitions are linked to theoretical frameworks and to value positions. For example, a conflict theorist may define *social class* as the power and property a group of people in society has or lacks. A structural functionalist defines it in terms of individuals who share a social status, life-style, or subjective identification. Although people disagree over definitions, the researcher should always state explicitly which definition he or she is using.

Before you can measure, you need a concept. You also need to distinguish what you are interested in from other things. The idea that you first need a construct or concept of what is to be measured simply makes sense. How can you observe or measure something unless you know what you are looking for? For example, we want to measure teacher morale. We first define *teacher morale*. What does the construct *morale* mean? As a variable construct, it takes on different values – high versus low or good versus bad morale. Next, we create a measure of this construct. This could take the form of survey questions, an examination of school records, or observations of teachers. Also, we distinguish morale from other things in the answers to survey questions, school records, or observations.

How can we develop a conceptual definition of *teacher morale*, or at least a tentative working definition to get started? Look in the everyday understanding of morale – something vague like “how people feel about things.” Also, look in the dictionary, which gives definitions like “confidence, spirit,

zeal, cheerfulness, esprit de corps, and mental condition towards something.” Look into the review of literature and see how other researchers have defined this concept. In this effort, we collect various definitions, parts of definitions, and related ideas, whereby we draw the boundaries of the core idea.

We find that most of these definitions say that morale is a spirit, feeling, or mental condition toward something, or a group feeling. But we are interested in *teacher* morale. We can ask teachers to specify as what does this construct mean to them? One strategy is to make a list of examples of high or low teacher morale. High teacher morale includes saying positive things about the school, not complaining about extra-work or enjoying being with students. Low morale includes complaining a lot, not attending school events unless required to, or looking for other jobs.

Morale involves a feeling toward something else; a person has morale with regard to something. A list of various “somethings” toward which teachers have feelings (e.g. students, parents, pay, the school administration, other teachers, the profession of teaching). Are there several kinds of teacher morale or all these “somethings” aspects of one construct? We have to decide whether morale means a single, general feeling with different parts or dimensions, or several distinct feelings.

What unit of analysis does our construct apply to: a group or an individual? Is morale a characteristic of an individual, of a group, or of both?

A researcher must distinguish the construct of interest from related constructs. How is our construct of teacher morale similar to or different from related concepts? For example, does *morale* differ from *mood*? We decide that mood is more individual and temporary than morale. Morale is a group feeling that includes positive or negative feelings about the future as well as other beliefs and feelings.

Who is a teacher? We have to decide.

b. Operationalization

Operationalization is the process of linking the conceptual definition to a specific set of measurement techniques or procedures. It links the language of theory with the language of empirical measures. Theory is full of abstract concepts, assumptions, relationships, definitions, and causality. Empirical measures describe how people concretely measure specific variables. They refer to specific operations or things people use to indicate the presence of a construct that exists in observable reality. Operationalization is done by looking at the behavioral dimensions, facets, or properties denoted by the concept. These are then translated into observable elements so as to develop an index of measurement of the concept. Operationally defining a concept involves a series of steps.

MEASUREMENT OF CONCEPTS (CONTINUED)**b. Operationalization**

Operationalization is the process of linking the conceptual definition to a specific set of measurement techniques or procedures. It links the language of theory with the language of empirical measures. Theory is full of abstract concepts, assumptions, relationships, definitions, and causality. Empirical measures describe how people concretely measure specific variables. They refer to specific operations or things people use to indicate the presence of a construct that exists in observable reality. Operationalization is done by looking at the behavioral dimensions, facets, or properties denoted by the concept. These are then translated into observable elements so as to develop an index of measurement of the concept. Operationally defining a concept involves a series of steps. Here is an example.

Operational definition: Dimensions and Elements**an example**

Let us try to operationally define **job satisfaction**, a concept of interest to educators, managers, and students alike. What behavioral dimensions or facets or characteristics would we expect to find in people with high job satisfaction? Let us first of all have a conceptual definition of job satisfaction. We can start it like this:

- Employees' feelings toward their job.
- Degree of satisfaction that individuals obtain from various roles they play in an organization.
- A pleasurable or positive emotional feeling resulting from the appraisal of one's job or job experience.
- Employee's perception of how well the job provides those things ('some things') that are important. These things are the dimensions of job satisfaction.

Dimensions of job satisfaction: For measuring job satisfaction it is appropriate to look at this concept from different angles relating with work. While employed in an organization the workers might be looking for many "things." Each of these things may be considered as a dimension; a person may be highly satisfied on one dimension and may be least satisfied on the other one. Those things that have usually been considered important at the place of work can be:

- The work itself.
- Pay/fringe benefits.
- Promotion opportunities.
- Supervision.
- Coworkers.
- Working conditions.

On each dimension the researcher has to develop logical arguments showing how this particular aspect (thing) relating to a worker's job is important whereby it has a bearing on his/her job satisfaction.

Elements of job satisfaction: It means breaking each dimension further into actual patterns of behavior that would be exhibited through the perception of the workers in an organization. Here again the researcher shall develop logical rationale for using a particular element for measuring a specific dimension. For example, let us look at each dimension and some of the corresponding elements:

- **Work itself: Elements** Opportunities to learn, sense of accomplishment, challenging work, routine work.
- **Pay/fringe benefits: Elements** Pay according to qualifications, comparison with other organizations, annual increments, and availability of bonuses, old age benefits, insurance benefits, and other allowances.

- **Promotion opportunities: Elements** Mobility policy, equitable, dead end job.
- **Supervision: Elements** Employee centered employee participation in decisions.
- **Coworkers: Elements** Primary group relations, supportive attitude, level of cohesiveness.
- **Working conditions: Elements** Lighting arrangements, temperature, cleanliness, building security, hygienic conditions, first aid facility, availability of canteen, availability of toilet facilities, availability of place for prayer.

On each element ask question (s), make statements. Look into the scalability of questions. The responses can be put on a scale indicating from high satisfaction to least satisfaction. In many cases the responses are put on a five-point scale (usually called Likert scale).

Lesson 17

RESEARCH DESIGN

A research design is a master plan specifying the methods and procedures for collecting and analyzing the data. It is a strategy or blueprint that plans the action for carrying through the research project data.

A research design involves a series of rational decision-making choices depending upon the various options available to the researchers. Broadly it is composed of different elements like: the purpose of the study, the unit of analysis, time dimension, mode of observation, sampling design, observation tools, data processing, and data analysis. Let us look at each one of these elements.

1. Purpose of the Study

From the perspective of purpose of the study, a research can be exploratory, descriptive, and explanatory (the distinctions we have already discussed). As we have already covered a number of steps in the research process, at this stage it is assumed that we are pretty sure about what we are looking for whereby we have gone much beyond the stage of an exploratory study (all studies have elements of exploration in them).

Beyond the exploratory stage now we are entering into the formal stage of delineating the plan for data collection, data processing, and data analysis. Here our focus is on whether our study is going to be a *descriptive* or *explanatory*. The essential difference between descriptive and explanatory studies lies in their objectives. If the research is concerned with finding out *who, what, where, when, or how much*, then the study is **descriptive**. If it is concerned with learning why – that is how one variable produces changes in another – it is causal. Research on crime as such is descriptive when it measures the types of crimes committed, how often, when, where, and by whom. In an **explanatory study**, we try to explain relationships among variables – for instance, why the crime rate is higher in locality A than in locality B. Every explanatory study in the beginning is likely to be descriptive as well.

Methodological rigor increases as one moves from exploratory study to explanatory study, which may encompass hypothesis testing involving multiple methods of data collection, sophistications in sampling designs, formulation of instruments of data collection, data processing, and data analysis. Since the purpose of the study is likely to determine how rigorous the research design is likely to be, therefore, the researcher would decide very early on about the purpose of his/her study.

Within the explanatory study, researcher may further decide about the type of investigation i.e. causal versus correlational. The researcher must decide whether a causal or correlational study is needed to find an answer to the issue at hand. The former is done when it is necessary to establish a definitive cause-and-effect relationship. If the researcher just wants a mere identification of **important factors “associated with” the problem**, then a correlational study is called for. Whether the study is basically a correlational or causal will help in deciding about the mode of observation – survey study or an experimental study.

2. Unit of Analysis

The unit of analysis refers to the level of aggregation of the data collected during the subsequent data analysis stage. If, for instance, the problem statement focuses on how to raise the motivational levels of employees in general, then we are interested in individual employees in the organization and would have to find out what we can do to raise their motivation. Here the unit of analysis is the **individual**. We will be looking at the data gathered from each individual and treating each employee's response as an individual data source.

If the researcher is interested in studying two-person interactions, then several two -person groups (also known as dyads) will become the unit of analysis. Analysis of husband-wife interactions in families and supervisor-subordinate relationship at the work place, teacher-student relationship in the educational institution are good examples of dyads as unit of analysis.

If the problem statement is related to group effectiveness, the unit of analysis would be at group level. In other words, even though we may gather relevant data from all individuals comprising, say six groups, we would aggregate the individual data into group data so as to see the differences among six groups. If we compare different departments in the organization, then data analysis will be done at the department level – that is, the individuals in the department will be treated as one unit – and comparisons made treating the department as a unit of analysis.

The research question determines the unit of analysis. Keeping the research question in view, it is necessary to decide on the unit of analysis since the data collection methods, sample size, and even the variables included in the framework may sometimes be determined or guided by the level at which the data are aggregated for analysis.

Units of analysis in a study are typically also the *units of observation*. Thus, to study voting intentions, we would interview (observe) individual voters. Sometimes, however, we “observe” our units of analysis indirectly. For example, we might ask husbands and wives their individual voting intentions, for purpose of distinguishing couples who agree and disagree politically. We might want to find out whether political disagreements tend to cause family disharmony, perhaps. In this case, our unit of analysis would be families, though the *unit of observation* would be the individual wives and husbands.

3. Time Dimension

Do we make the observations more or less at one time or over a long period, former called as cross-sectional studies and the latter as longitudinal studies? While planning the strategy for data collection the time dimension may be an important component.

Cross-Sectional Studies are carried out once and represent a snapshot of one point in time. Data are collected just once, perhaps over a period of days or weeks or months, in order to answer the research question.

Longitudinal Studies are repeated over an extended period. The advantage of longitudinal studies is that it can track changes over time. For example, the researcher might want to study employees’ behavior before and after a change in the top management, so as to know what effects the change accomplished. Here, because data are gathered at two different points in time, the study is not cross-sectional or of the one-shot kind, but is carried longitudinally across a period of time. Such studies, as when data on the dependent variable are gathered at two or more points in time to answer the research question, are called longitudinal. Longitudinal studies can be *panel studies* and *cohort studies* which were discussed earlier.

4. Researcher Control of Variables

In terms of researcher’s ability to manipulate variables, we can differentiate between experimental and ex post facto design. In an **experiment**, the researcher attempts to control and/or manipulate the variables in the study. It is enough that we can cause variables to be changed or held constant in keeping with our research objectives. Experimental design is appropriate when one wishes to discover whether certain variables produce effects in other variables. Experimentation provides the most powerful support possible for hypothesis of causation.

Experimental studies can be contrived and non-contrived. Research can be done in the natural environment where work proceeds normally (i.e. in non-contrived setting) or in artificial, contrived setting, rigorous causal studies are done in contrived lab settings. Correlational studies done in organizations are called field studies. Studies conducted to establish cause-and-effect relationship using the same natural environment are called **field experiments**. Here the researcher does not interfere with the natural occurrence of events in as much as independent variable is manipulated.

Experiments done to establish cause and effect relationship beyond the possibility of the least doubt require the creation of an artificial, contrived environment in which all the extraneous factor are strictly controlled. Similar subjects are chosen carefully to respond to certain manipulated stimuli. These studies are referred to as **lab experiments**.

With an **ex post facto** design, investigators have no control over the variables in the sense of being able to manipulate them. They can only report what has happened or what is happening. It is important that the researchers using this design not influence the variables; to do so introduce bias. The researcher is limited to holding factors constant by judicious selection of subjects according to strict sampling procedures and by statistical manipulation of findings. Survey research is an example of such study.

5. Choice of Research Design: Mode of Observation

There could be number of ways to collect the data depending upon whether the study is quantitative or qualitative, descriptive or explanatory, cross-sectional or longitudinal, and contrived or non-contrived, the researcher decides about the mode of observation. The modes could be like: survey, experiment, communication analysis (content analysis) field observation, case study, focus group discussion.

6. Sampling Design

The basic idea of sampling is that by selecting some of the elements in population, we may draw conclusions about the entire population. A population element is the subject on which the measurement is being taken. It is the unit of analysis. Sampling has its own advantages and disadvantages. Depending upon the nature of the study the researchers decides about following appropriate type of sampling design.

7. Observation Tools

Observation tool mostly used by social researchers are: questionnaire, interview schedule, interview guide, and check list. In the research design, the researcher will specify the tools of data collection along the logic justifying the appropriateness of the selected tool.

8. Field Data Collection

Depending upon the mode of observation, the researcher will outline the procedure for field operations. The researcher will try to look after the questions like: How the data will be collected? Who will be responsible for the collections of data? What training will be imparted to the field functionaries? How will the quality control of data be maintained?

9. Data Processing and Data Analysis

In the research design the researcher is required to tell how the data shall be processed (manually, mechanically), and analysis plans explicated. In case the qualitative data are to be quantified the procedures should be spelled out. The procedures for the construction of score Indexes, if any, should be explained. The research design should also say something about the analysis plan, the use of statistics, and the inferences to be drawn.

Survey Research: An Overview

Surveys require asking people, who are called **respondents**, for information, using either verbal or written questions. Questionnaires or interviews are utilized to collect data on the telephone, face-to-face, and through other communication media. The more formal term **sample survey** emphasizes that the purpose of contacting respondents is to obtain a representative sample of the target population.

Thus, a **survey** is defined as a method of gathering **primary data** based on communication with a representative sample of individuals.

Steps in Conducting a Survey

The survey researcher follows a deductive approach. He or she begins with a theoretical or applied research problem and ends with empirical measurement and data analysis. Once a researcher decides that survey is an appropriate method, basic steps in a research project can broadly be divided into six sub-steps.

1. **Develop the hypothesis; decide on type of survey (mail, interview, telephone); write survey questions (decide on response categories, design lay out).** The researcher develops an instrument – a survey questionnaire or interview schedule – that he or she uses to measure variables. Respondents read the questions themselves and mark answers on a *questionnaire*. An *interview schedule* is a set of questions read to the respondent by an interviewer, who also records the responses. To simplify the discussion, we will use only the term *questionnaire*.
2. **Plan how to record data; pilot test survey instrument.** When preparing the questionnaire, the researcher thinks ahead to how he or she will record and organize data for analysis. The questionnaire is pilot tested on a small set of respondents similar to those in the final survey.
3. **Decide on target population; get sampling frame; decide on sample size; select the sample.**
4. **Locate respondents; conduct interviews; carefully record data.** The researcher locates sampled respondents in person, by telephone, or by mail. Respondents are given information and instructions on completing the questionnaire or interview.
5. **Enter data into computers; recheck all data; perform statistical analysis on data.**
6. **Describe methods and findings in research report; present findings to others for critique and evaluation.**

EXPERIMENTAL RESEARCH

Experimental research builds on the principles of positivist approach more directly than do the other research techniques. Researchers in the natural sciences (e.g. chemistry and physics), related applied fields (e.g. engineering, agriculture, and medicines) and the social sciences conduct experiments. The logic that guides an experiment on plant growth in biology or testing a metal in engineering is applied in experiments on human social behavior. Although it is most widely used in psychology, the experiment is found in education, criminal justice, journalism, marketing, nursing, political science, social work, and sociology.

The purpose of experimental research is to allow the researcher to *control* the research situation so that *causal* relationships among variables may be evaluated. The experimenter, therefore, manipulates a single variable in an investigation and holds constant all other, extraneous variables. (Events may be controlled in an experiment in a way that is not possible in a survey). The goal of the experimental design is the confidence that it gives the researcher that his experimental treatment is the cause of the effect he measures.

Experiment is a research design in which conditions are controlled so that one or more variables can be manipulated in order to test a hypothesis. Experimentation is a research design that allows evaluation of causal relationship among variables.

Experiments differ from other research methods in terms of degree of control over the research situation. In a typical experiment one variable (the *independent variable*) is manipulated and its effect on another variable (the *dependent variable*) is measured, while all other variables that may confound such relationship are eliminated or controlled. The experimenter either creates an artificial situation or deliberately manipulates a situation.

Once the experimenter manipulates the independent variable, changes in the dependent variable are measured. The essence of a behavioral experiment is to do something to an individual and observe his or her reaction under conditions where this reaction can be measured against a known baseline.

To establish that variable X cause's variable Y, *all three* of the following conditions should be met:

1. Both X and Y should co-vary (i.e. when one goes up, the other should also simultaneously go up (or go down).
2. X (the presumed causal factor) should precede Y. In other words, there must be a time sequence in which the two occur.
3. No other factor should possibly cause the change in the dependent variable Y.

It may thus be seen that to establish causal relationships between two variables in an organizational setting, several variables that might co -vary with the dependent variable have to be controlled. This would then allow us to say that variable X and variable X alone causes the dependent variable Y. Useful as it is to know the cause-and-effect relationships, establishing them is not so easy, because several other variables that co -vary with the dependent variable have to be controlled. It is not always possible to control all the covariates while manipulating the causal factor (the independent variable that is causing the dependent variable) in organizational settings, where events flow or occur naturally and normally. It is, however, possible to first isolate the effects of a variable in a tightly controlled artificial setting (the lab setting), and after testing and establishing the cause-and-effect relationship under these tightly controlled conditions, see how generalizable such relationships are to the field setting.

The Language of Experiments

Experimental research has its own language or set of terms and concepts. One important term frequently used is *subjects* or *test units*. In experimental research, the cases or people used in research projects and on whom variables are measured are called the *subjects* or *test units*. In

other words, these are those entities whose responses to the experimental treatment are measured or observed. Individuals, organizational units, sales territories, or other entities may be the test units. Similar terminology is used on different component parts of the experiments.

Parts of Experiments:

We can divide the experiments into seven parts and for each part there is a term. Not all experiments have all these parts, and some have all seven parts plus others. The following seven usually make up a true experiment.

1. Treatment or independent variable.
2. Dependent variable.
3. Pretest.
4. Posttest.
5. Experimental group.
6. Control group.
7. Assignment of subjects.

Treatment or independent variable:

The experimenter has some degree of control over the independent variable. The variable is independent because its value can be manipulated by the experimenter to whatever he or she wishes it to be. In experimental design the variable that can be manipulated to be whatever the experiment wishes. Its value may be changed or altered independently of any other variable.

In most experiments, a researcher creates a situation or enters into an ongoing situation, then modifies it. The treatment (or the stimulus or manipulation) is what the researcher modifies. The term comes from medicine, in which a physician administers a treatment to patients; the physician intervenes in a physical or psychological condition to change it. It is the independent variable or the combination of independent variables.

In experiments, for example, the researcher creates a condition or situation. Look at “the degree of fear or anxiety”; the levels are high-fear or low-fear situation. Instead of asking the subjects, as we do in surveys, whether they are fearful, experimenter puts the subjects into either in a high-fear or low- fear situation. They measure the independent variable by manipulating conditions so that some subjects feel a lot of fear and others feel little.

Researchers go to great lengths to create treatments. They want the treatment to have an impact and produce specific reactions, feelings, or behaviors.

It also possible the researchers look at the alternative manipulations of the independent variable being investigated. In business research, the independent variable is often categorical or classificatory variable, representing some classifiable or qualitative aspects of management strategy. To determine the effects of training, for example, the experimental treatment that represents the independent variable is the training program itself.

Dependent Variable:

Dependent variable is the criterion or standard by which the results are judged. It is assumed that the changes in the dependent variable are consequence of changes in the independent variable. For example, measures of turnover, absenteeism, or morale might be alternative choices for the dependent variable, depending on the purpose of the training.

The outcomes in the experimental research are the physical conditions, social behaviors, attitudes, feelings, or beliefs of subjects that change, in response to treatment. Dependent variables can be measured by paper-and -pencil indicators, observations, interviews, or physiological responses (e.g. heartbeat, or sweating palms).

Selection of dependent variable is crucial decision in the design of an experiment. 

Pretests and Posttests:

Frequently a researcher measures the dependent variable more than once during an experiment. The *pretest* is the measurement of the dependent variable prior to the introduction of the treatment. The *posttest* is the measurement of the dependent variable after the treatment has been introduced into the experimental situation.

Experimental and Control Groups:

Experimental researchers often divide subjects into two or more groups for purposes of comparison. A simple experiment has only two groups, only one of which receives the treatment. The experimental group is the group that receives the treatment or in which the treatment is present.

The group that does not receive the treatment is called the “control group.” When the independent variable takes on many different values, more than one experimental group is used.

In the simplest type of experiment, only two values of the independent variable are manipulated. For example, consider measuring the influence of a change in work situation, such as playing music over an intercom during working hours, on employee productivity. In the experimental condition (the treatment administered to the **experimental group**), music is played during working hours. In the control condition (the treatment administered to the **control group**), the work situation remains the same, without change. By holding conditions constant in the control group, the researcher controls for potential sources of error in the experiment. Productivity, (the dependent variable) in the two groups is compared at the end of the experiment to determine whether playing the music (the independent variable) has any effect.

Several experimental treatment levels can also be used. The music/productivity experiment, with one experimental and one control group, may not tell the researcher everything he or she wishes to know about the music/productivity relationship. If the researcher wished to understand the functional nature of the relationship between music and productivity at several treatment levels, additional experimental groups with music played for only 2 hours, only for 4 hours, and only for 6 hours might be studied. This type of design would allow the experimenter to get a better idea about the impact of music on productivity.

Assignment of Subjects/Test Units:

Social researchers frequently want to compare. When making comparisons, the researchers want to compare the cases that do not differ with regard to variables that offer alternative explanations. Therefore, the groups should be similar in characteristics in such a way that the change in the dependent variable is presumably the outcome of the manipulation of the independent variable, having no alternative explanations.

Random assignment (Randomization) is a method for assigning the cases (e.g. individuals, organizations) to groups for the purpose of making comparisons. It is a way to divide or sort a collection of cases into two or more groups in order to increase one’s confidence that the groups do not differ in a systematic way. It is a mechanical method; the assignment is automatic, and the researcher cannot make assignments on the basis of personal preference or the features of specific cases.

Random assignment is random in statistical/mathematical sense, not in everyday sense. In everyday speech, random means unplanned, haphazard, or accidental, but it has a special meaning in mathematics. In probability theory, random describes a process in which each case has a known

chance of being selected. Random selection allows the researcher calculate the odds that a specific case will be sorted into one group or the other. A random process is the one in which all cases have an exactly equal chance of ending up in one or the other group.

Random assignment or randomization is unbiased because a researcher's desire to confirm a hypothesis or a research subject's personal interests does not enter into the selection process. It also assures the researcher that repetitions of an experiment – under the controlled conditions – will show true effects, if they exist. Random assignment of subjects allows the researcher to assume that the groups are identical with respect to all variables except for experimental treatment.

Random assignment of subjects to the various experimental groups is the most common technique used to prevent test units from differing from each other on key variables; it assumes that all the characteristics of these subjects have been similarly randomized. If the experimenter believes that certain extraneous variable may affect the dependent variable, he or she may make sure that the subjects in each group are matched on these characteristics. **Matching** the subjects on the basis of pertinent background information is another technique for controlling assignment errors.

Matching presents a problem: What are the relevant characteristics to match on, and can one locate exact matches? Individual cases differ in thousands of ways, and the researcher cannot know which might be relevant.

Three Types of Controls

1. **Manipulation of the Independent Variable:** In order to examine the causal effects of an independent variable on a dependent variable, certain manipulations need to be tried. Manipulation simply means control over the stimulus that is we create different levels of the independent variable to assess the impact on the dependent variable. Let us say we want to test the effects of lighting on worker production levels among sewing machine operators. To establish cause and effect relationship, we must measure the production levels of all the operators over a 15-day period with the usual amount of light they work with – say 60 watt bulbs. We might then want to split the group of 60 operators into three groups of 20 members each, and while allowing the subgroup to continue to work under the same conditions as before (60-watt electric light bulbs). We might want to manipulate the intensity of the light for the other two subgroups, by making one group work with 75 watts and the other with 100 watt light bulbs. After the different groups have worked with these varying degrees of light exposure for 15 days, each group's total production for these 15 days may be analyzed to see the difference between the pre-experimental and the post experimental productions among the groups is directly related to the intensity of the light to which they have been exposed. If our hypothesis that better lighting increases the production levels is correct, the subgroups that did not have any change in the lighting (control group), should have no increase in production and the other two groups should show increases, with the one having the most light (100 watts) showing greater increases than those who had the 75 watt lighting. In this case the independent variable, lighting, has been manipulated by exposing different groups to different degrees of changes in it. This manipulation of the independent variable is also known treatment, and the results of the treatment are called treatment effects.
2. **Holding Conditions Constant:** When we postulate cause-and-effect relationships between two variables X and Y, it is possible that some other factor, say A, might also influence the dependent variable Y. In such a case, it will not be possible to determine the extent to which Y occurred only because of X, since we do not know how much of the total variation was caused by the presence of the other factor A. If the true effect of the X is to be assessed, then the effect of A has to be controlled. This is also called as controlling the effect of contaminating factors or confounding factors.
3. **Control over the Composition of Groups:** If the experimental and control groups have such characteristics that could contaminate the results then the researcher may have to take note of such factors, if there are any. The group differences should not confound the effect of X variable that

happens to be under study. The experimental and control groups need to be balanced. For this purpose, the researcher may use **random selection** of the subjects and allocating to different groups. Finally, the experimental and control groups should also be selected randomly. Another way have identical groups is by following the procedure of **matching**. One could look at the possible characteristics of the subjects that could contaminate the effect of X variable, and try to distribute these evenly in all the groups. So pick up one subject and try to match it with another subject on the specified characteristics (age, gender, education, marital status) and put one subject in one group and the other in the other group. After the formation of groups, the researcher may randomly decide about experimental and control groups.

Random Assignment

Social researchers frequently want to compare. For example, a researcher has two groups of 15 students and wants to compare the groups on the basis of key differences between them (e.g. a course that one group completed). Or a researcher has five groups of customers and wants to compare the groups on the basis of one characteristic (e.g. geographic location). **“Compare apples with apples, don’t compare apples with oranges.”** It means that a valid comparison depends on comparing things that are fundamentally alike. Random assignment facilitates comparison in experiments by creating similar groups.

Random assignment is a method for assignment cases (e.g. individuals, organizations) to groups for the purpose of making comparisons. It is a way to divide or sort a collection of cases into two or more groups in order to increase one’s confidence that the groups do not differ in a systematic way. It is mechanical method; the assignment is automatic, and the researcher cannot make assignments on the basis of personal preference or the features of specific cases.

Random assignment is random in a statistical or mathematical sense, not in an everyday sense. In everyday speech, random means unplanned, haphazard, or accidental, but it has a specialized meaning in mathematics. In probability theory, *random* describes a process in which each case has a known chance of being selected. Random assignment lets a researcher calculate the odds that a specific case will be sorted into one group over another.

Random assignment or randomization is unbiased because a researcher’s desire to confirm a hypothesis or a research subject’s personal interest does not enter into selection process.

Matching

It implies to match the characteristics (such as age, sex) of the cases in each group. Matching is an alternative to random assignment, but it is an infrequently used one.

Matching presents a problem: What are the relevant characteristics to match on, and can one locate exact matches. Individual cases differ in thousands of ways, and the researcher cannot know which might be relevant. Therefore, randomization is preferred over matching. It takes care of the contaminating factors.

Lesson 19

EXPERIMENTAL RESEARCH II**Steps in Conducting an Experiment**

Following the basic steps of the research process, experimenters decide on a topic, narrow it into a testable research problem or question, and then develop a hypothesis with variables. Once a researcher has the hypothesis, the steps of experimental research are clear. Broadly there are about 12 steps in conducting an experiment, which are as below:

1. Begin with a straightforward hypothesis that is appropriate for experimental research.
2. Decide on an experimental design that will test the hypothesis within practical limitations. The researcher decides the number of groups to use, how and when to create treatment conditions, the number of times to measure the dependent variable, and what the groups of subjects will experience from beginning till end.
3. Decide how to introduce the treatment or create a situation that induces the independent variable.
4. Develop a valid and reliable measure of the dependent variable.
5. Set up an experimental setting and conduct a pilot test of the treatment and dependent variable measures.
6. Locate appropriate subjects or cases.
7. Randomly assign subjects to groups (if random assignment is used in the chosen research design) and give careful instructions.
8. Gather data for the pretest measure of the dependent variable for all groups (if pretest is used in the chosen design).
9. Introduce the treatment to the experimental group only (or to the relevant groups if there are multiple experimental groups) and monitor all groups.
10. Gather data for posttest measure of the dependent variable.
11. Debrief the subjects by informing them of the true purpose and reasons for the experiment. Ask subjects what they thought was occurring. Debriefing is crucial when subjects have been deceived about some aspect of the treatment.
12. Examine data collected and make comparisons between different groups. Where appropriate, use statistics and graphs to determine whether or not the hypothesis is supported.

Types of Designs

Researchers combine parts of experiment (e.g. pretests, control groups, etc.) together into an experimental design. For example, some designs lack pretests, some do not have control groups, and others have many experimental groups. Certain widely used standard designs have names.

Classical Experimental Design:

All designs are variations of the classical experimental design, which has random assignment of subjects, a pretest and a posttest, an experimental group, and a control group.

Quasi-Experimental Designs:**One-shot Case Study Design:**

Also, called the one-group posttest-only design, the one-shot case study design has only one group, a treatment, and a posttest. Because it is only one group, there is no random assignment. For example, a researcher shows a group of students a horror film, then measures their attitude with a questionnaire. A weakness of this design is that it is difficult to say for sure that the treatment caused the dependent variable. If subjects were the same before and after the treatment, the researcher would not know it.

One Group Pretest-posttest Design:

This design has one group, a pretest, a treatment, and a posttest. It lacks a control group and random assignment. Continuing with the previous example, the researcher gives a group of students an attitude questionnaire to complete, shows a horror film, then has them complete the same questionnaire second time. This is an improvement over the one-shot case study because the researcher measures the dependent variable both before and after the treatment. But it lacks the control group for comparison. The researcher cannot know whether something other than the treatment occurred between the pretest and the posttest to cause the outcome.

Two Groups Posttest-only Design:

It has two groups, a random assignment of subjects, a posttest, and a treatment. It has all parts of the classical design except a pretest. Continuing with our previous example, the researcher forms two groups through randomization process. He shows group a horror film to one group i.e. the experimental group. The other group is not shown any film. Both groups then complete the questionnaire. The random assignment reduces the chance that the groups differed before the treatment, but without a pretest, a researcher cannot be as certain that the groups began the same on the dependent variable.

True Experimental Designs

Experimental designs, which have at least two groups, a random assignment of subjects to experimental and control groups, only experimental group is exposed to treatment, both groups record information before and after the treatment, are known as ex-post facto experimental designs.

Pretest and Posttest Experimental and Control Group Design:

Two groups, one control group and the other experimental group, are formed randomly. Both the groups are exposed to pretest and posttest. The experimental group is exposed to treatment while the control group is not. Measuring the difference between the differences in the post- and pretests of the two groups would give the net effects of the treatment.

Experimental Group: Pretest (O1)	X	Posttest
(O2) Control Group: Pretest (O3)	-	Posttest (O4)

Randomization used for setting up the group.

$[(O2 - O1) - (O4 - O3)] = \text{Treatment effect (could be anywhere between 0 to -1 or +1).}$

Solomon's Four Group Design:

To gain more confidence in internal validity in experimental designs, it is advisable to set up two experimental groups and two control groups. One experimental group and one control group can be given the both pretest and the posttest. The other two groups will be given only the posttest. Here the effects of treatment can be calculated in several different ways as shown in figure 1:

Figure 1: Solomon's four group design

Group	Pretest	Treatment	Posttest
1.Experimental	O1	X	O2
2.Control	O3	-	O4
3.Experimental	-	X	O5
4.Control	-	-	O6

$(O2 - O1)$

= E

$(O4 - O3)$

= E

$(O5 - O6)$

= E

$(O5 - O3)$

= E

$[(O2 - O1) - (O4 - O3)] =$

E

E =

Effect

If all Es are similar, the cause and effect relationship is highly valid.

Interaction Effect

The effect of two variables together is likely to be greater than the individual effect of each put together. The idea of an interaction effect is familiar, especially in the area of medicine or illness. As an example, imagine that for a given population of 100 persons, all of the same age and sex, it was found that if all 100 smoked cigarettes the effect would be a lung cancer rate of 20 percent. Assume that for an identical group of 100 persons who did not smoke but lived in a smoggy environment, 10 percent would get lung cancer. Now consider a third identical group of 100

persons all of whom smoke and also live in a smoggy environment. The additive effect of both smoking and smog would be 20 percent plus 10 percent, or a total of 30 percent (30 people) having cancer. However, imagine that an actual medical survey of the population shows a cancer rate of 37 percent among persons experiencing both smoking and smog. This extra 7 percent can be computed residually as:

$$\text{Interaction Effect} = \text{Total effect} - (\text{smoking effect} + \text{smog effect}) = 37 \text{ percent}$$

$$= 37 \text{ percent} - (20 \text{ percent} + 10 \text{ percent})$$

$$= 37 \text{ percent} - 30 \text{ percent}$$

$$= 7 \text{ percent}$$

In experiments, we have the pretests and posttests, in which case we use the same instrument for measuring the dependent variable, for example racial prejudice as an effect of a movie. In pretest is a questionnaire in which items forming the prejudice scale are dispersed at random among other items so that the subject does not know that his or her level of racial prejudice is being measured.

Nevertheless, the measurement of this variable (prejudice) itself, by presenting questions about race relations may stimulate the subject's thinking and actually cause a change in his or her level of racial prejudice. Any pretest effect that occurs will be visible as part of extraneous change (change caused by the test stimulus) in the control group, as the pretest is also presented to the control group. Any change between the pretest and posttest for measuring the dependent variable in the control group may be attributed to the sensitization of the subjects with the instrument. In the experimental group, of course a movie (an X variable) was shown due to which we expect a change in the racial prejudice of the subjects. But that is not all. The subjects in the experimental group were also exposed to the instrument for measuring the racial prejudice, hence they were also sensitized. Their posttest results include the combined effect of exposure to a movie and that of sensitization to the instrument. In other words, the racial prejudice of the subjects in the experimental group exhibits the interaction effect of the treatment plus that of sensitization of the instrument.

In order to calculate the interaction effect in the experiment we shall have two experimental groups and one control group created by using the randomization process.

It may look like this:

Experimental group 1: Pretest (O1)		X	Posttest (O2)
Control group:	Pretest (O3)	-	Posttest (O4)

Why O4 be different from O3? The difference may be due to sensitization. So, let us figure it out. Let us take another experimental group and we do not pretest i.e. no sensitization with the instrument.

Experimental group 2: No pretest X **Posttest (O5)**

Let us work out the results:

$$(O2 - O1) = D$$

$$(O4 - O3) = D/$$

$(O5 - O3) = D//$ (Since all groups are identical, so we can use the pretest of any of the

Other two groups)

Interaction effect = $D - [D/ + D//]$. Substituting it with our example of lung cancer

$$37 - [10 + 20] = 37 - 30 = 7$$

There are many other experimental designs like the randomized block design, Latin square design, natural group design, and factorial design.

Lesson 20

EXPERIMENTAL RESEARCH III

Validity in Experiments

Experiments are judged by two measures. The first, internal validity indicates whether the independent variable was the sole cause of the change in the dependent variable. It implies the researcher's ability to eliminate alternative explanations of the dependent variable. Variables, other than the treatment, that affect the dependent variable are threats to internal validity. They threaten the researcher's ability to say that the treatment was the true causal factor producing change in the dependent variable. The second measure, external validity, indicates the extent to which the results of the experiment are applicable in the real world.

Internal validity is high in the laboratory experiment, reason being the control over all the confounding factors. External validity (generalizability) is not sure because of the effect of variety of factors. Field experiments have more external validity but less internal validity because it is closer to the real situations.

Factors Affecting Internal Validity

In choosing or evaluating experimental research design, researchers must determine whether they have internal and external validity. There are eight major types of extraneous variables that may jeopardize internal validity: History effect, maturation effect, testing effect, instrumentation effect, selection bias effect, statistical regression, mortality, and mechanical loss.

1. History Effect:

A specific event in the external environment occurring between the first and second measurement that is beyond the control of the experimenter and that affects the validity of an experiment. Advertisement of a particular product (mineral water) and its sale is affected by an event in the society (contamination of drinking water). The researcher does not have control on such happenings which have an impact on the X and Y relationship.

2. **Maturation Effect:** Cause and effect relationship can also be contaminated by the effects of the passage of time – another uncontrollable variable. Such contamination is called maturation effect. The maturation effects are a function of the processes – biological and psychological – operating within the subjects as a result of the passage of time. Examples of maturation processes could include *growing older, getting tired, feeling hungry, and getting bored*. In other words, there could be maturation effect on the dependent variable purely because of the passage of time. For example, let us say that an R & D director intends that an increase in the efficiency of workers would result within three months' time if advanced technology is introduced in the work setting. If at the end of three months increased efficiency is indeed found, it will be difficult to claim that the advanced technology (and it alone) increased the efficiency of workers, because with the passage of time, employees would also gain experience, resulting in better performance and therefore improved efficiency. Thus, the internal validity also gets reduced owing to the effects of maturation in as much as it is difficult to pinpoint how much of the increase is attributable to the introduction of the enhanced technology alone.

3. **Testing Effects:** Frequently, to test the effects of treatment, subjects are given what is called a **pretest** (say, a short questionnaire eliciting their feelings and attitudes). That is, a measure of the dependent variable is taken (pretest), then the treatment given, and after that a second test, called **posttest**, administered. The difference between the posttest and the pretest scores is then attributed to the treatment. However, the very fact that the subjects were exposed to the pretest might influence their responses on the posttest, which will adversely impact on internal validity. It is also called sensitization through previous testing.

4. Instrumentation Effects: Instrumentation effects are yet another source of threat to internal validity. These might arise because of a change in the measuring instrument between pretest and posttest, and not because of the instrument's differential impact at the end. For example, in a weight-loss experiment, the springs on the scale weaken during the experiment, giving lower readings in the posttest.

A change in the wording of questions (may be done to avoid testing effects), change in interviewers, or change in other procedures to measure the dependent variable can cause instrumentation effect.

Performance of the subjects measured by the units of output in the pretest, but when measuring the output in posttest the researcher measures it by the number of units rejected, and the amount of resources expended to produce the units.

5. Selection Bias Effect: Selection bias is the threat that subjects will not form equivalent groups. It is a problem in design without random assignment, hence differential selection of the subjects for the comparison groups. It occurs when subjects in one experimental group have a characteristic that affects the dependent variable. For example, in an experiment on physical aggressiveness, the experimental group unintentionally contains subjects who are sportsmen, whereas the control group is made up of musicians, chess players, and painters.

6. Statistical Regression: Statistical regression is not easy to grasp intuitively. It is a problem of extreme values or a tendency for random error to move group results towards the average. If extremes are taken, then they tend to regress toward the mean. Those who are on either end of the extreme would not truly reflect the cause and effect relationship.

One situation arises when subjects are unusual with regard to dependent variable. Because they begin as unusual or extreme, subjects are likely to respond further in the same direction. For example, a researcher wants to see whether violent films make people act violently. The researcher chooses a group of violent criminals from a high security prison, gives them a pretest, shows violent films, and then administers a posttest. To the researcher's surprise, the criminals are slightly less violent after the film, whereas a control group of non-prisoners who did see the film are slightly more violent than before. Because the violent criminals began at an extreme, it is unlikely that a treatment could make them more violent; by random chance alone, they appear less extreme when measured a second time.

If participants chosen for experimental group have extreme scores on the dependent variable to begin with then the laws of probability say that those with very low scores on a variable have a greater probability to improve and scoring closer to mean on the posttest after treatment. This phenomenon of low scorers tending to score closer to the mean is known as "regressing toward the mean."

Likewise, those with high scores have a greater tendency to regress toward the mean – will score lower on the posttest than on pretest. Thus, the extremes will not "truly" reflect the causal relationship

– a threat to internal validity.

7. Mortality: Mortality, or attrition, arises when some subjects do not continue throughout the experiment. Although the word mortality means death, it does not necessarily mean that subjects have died. If a subset of subjects leaves partway through an experiment, a researcher cannot whether the results would have been different had the subjects stayed. Even with departure of few subjects, the groups do not remain balanced.

Consider for example of a training experiment that investigates the effects of close supervision of salespersons (high pressure) versus low supervision (low supervision). The high - pressure condition may misleadingly appear to be superior if those subjects who completed the experiment did very well. If, however, the high-pressure condition caused more subjects to drop-out than the other condition, this apparent superiority may be due to a self-selection bias (those who could not bear the pressure had left – mortality) – perhaps only very determined and/or talented salespersons made it through the end of the experiment. **Mechanical Loss:** A problem

may be experienced due to equipment failure. For example, in an experiment if the subjects are told that their behavior is being videotaped, and during the experiment the video equipment failed to work for some subjects, then the validity of the results could become doubtful.

8. Experimenter Expectancy: In addition to the usually listed eight factors affecting the internal validity sometimes **experimenter expectancy** may threaten the causal logic of the relationship between the variables. A researcher may threaten internal validity, not purposefully unethical behavior but by indirectly communicating experimenter expectancy to the subjects. Researchers may highly have committed to the hypothesis and indirectly communicate desired findings to subjects. For example, a researcher studying reactions towards disabled deeply believes that females are more sensitive toward the disabled than the males are. Through eye contact, tone of voice, pauses, and other nonverbal communication, the researcher unconsciously encourages female subjects to report positive feelings toward the disabled; the researcher's nonverbal behavior is the opposite for male subjects.

The **double-blind experiment** is designed to control experimenter expectancy. In it, people who have direct contact with subjects do not know the details of the hypothesis or the treatment. It is **double** blind because both the subjects and those in contact with them are blind to details of the experiment. For example, a researcher wants to see if new drug is effective. Using capsules of three colors – green, yellow, and pink -- the researcher puts the new drug in the yellow capsule, puts an old drug in the pink one, and take the green capsule a **placebo** – a false treatment that appears to be real (e.g., a sugar capsule without any physical effects). Assistants who give the capsules and record the effects do not know which color contains the new drug. Only another person who does not deal with subjects directly knows which colored capsule contains the drug and examines the results.

External Validity

Even if the researcher eliminates all concerns for internal validity, external validity remains a potential problem. External validity is the ability to generalize experimental findings to real life situations. Without external validity, the findings are of little use for both basic and applied research i.e we shall not be able to develop any theories that could be applicable to similar other situations.

Reactivity: A Threat to External Validity

Subjects may react differently in an experiment than they would in real life; because they know they are in a study. *The Hawthorn Effect*, a specific kind of reactivity to the experimental situation is a good example in this respect. The experiment was conducted in the Hawthorn Electric Company where the performance of the participants was supposed to change due to the change in the environmental conditions i.e. improvement on the environmental conditions will have a positive effect on the performance. The researchers modified many aspects of the working conditions and measured productivity. Productivity rose after each modification. Productivity rose even if there was no real modification but it was announced that there is a modification. The behavior change was simply a reaction to the announcement of modification and some other factors like the participants were being watched and had a feeling of being 'very important persons.'

Here the workers did not respond to treatment (modification of working conditions) but to the additional attention they received (being in the experiment and being the focus of attention).

Demand characteristic (discussed earlier) is another type of reactivity. Here the participants change their behavior as a reaction to the demands of the experimenter who may have inadvertently told the subjects about the expected outcome of the treatment. They change their behavior as demanded by the experimenter.

Ethical Issues in Lab Experiments

We have already discussed the ethical issues in research. Just for the sake of emphasis, it may be appropriate to very briefly repeat some of those which are specifically relevant to experimental designs. The following actions may be unethical:

- Putting pressure on individuals to participate in experiments through coercion, or apply social pressure.
- Asking demeaning questions from the subjects that hurt their self-respect or giving menial task to subjects that diminish their self-respect.
- Deceiving subjects by deliberately misleading them as to the true purpose of research.
- Exposing participants to physical or mental stress.
- Not allowing subjects to withdraw from the experiment when they want to.
- Using research results to disadvantage the participants, or for purposes not to their liking.
- Not explaining the procedures to be followed in the experiment.
- Exposing subjects to hazardous and unsafe environments.
- Not debriefing the participants fully and accurately after the experiment is over.
- Not preserving the privacy and confidentiality of the information given by the participants.
- Withholding benefits from the control group.

Human Subjects Committee

In order to protect the rights of participating subjects the research institutions have usually set up Ethics Committees. Sometime project specific ethics committees are also formed. Such committees try to look after the rights of the subjects participating in the experiments, as well as in other research techniques.

LESSON 21

SURVEY RESEARCH

Research Design can be classified by the *approach* used to gather primary data. There are really two alternatives. We can *observe* conditions, behavior, events, people, or processes. Or we can *communicate* with people about various topics, including participants' attitudes, motivations, intentions, and expectations.

The **communication approach** involves surveying people and recording their responses for analysis. The great strength of the survey as a primary data collecting approach is its versatility. What media do we use for communicating with people? The traditional face to face communication (interview) for conducting surveys is still in vogue. Nevertheless, the digital technology is having a profound impact on the society as well as on research. Its greatest impact is on the creation of new forms of communication media.

Human Interactive Media and Electronic Interactive Media

When two people engage in conversation, human interaction takes place. **Human interactive media** are personal forms of communication. One human being directs a message to and interacts with another individual (or a small group). When they think of interviewing, most people envision this type of face-to-face dialogue or a conversation on telephone.

Electronic interactive media allows researchers to reach a large audience, to personalize individual messages, and to interact with members of the audience using digital technology. To a large extent electronic interactive media users are controlled by the users themselves. In the context of surveys, respondents are not passive audience members. They are actively involved in a two-way communication when electronic interactive media are utilized.

The Internet, the medium that is radically altering many organizations' research strategies, provides a prominent example of the new electronic interactive media.

Non-Interactive Media

The traditional questionnaire received by mail and completed by the respondent does not allow a dialogue or exchange of information for immediate feedback. Self-administered questionnaires printed on paper are also non-interactive.

CHOOSING A COMMUNICATION MEDIA

Once the researcher has determined that surveying is the appropriate data collection approach, various means may be used to secure information from individual. A research can conduct a survey by personal interview, telephone, mail, computer, or a combination of these media.

Personal Interviewing

A personal interview (i.e. face to face communication) is a two- w a y conversation initiated by an interviewer to obtain information from a respondent. The differences in the roles of the interviewer and the respondent are pronounced. They are typically strangers, and the interviewer generally controls the topics and patterns of discussion. The consequences of the event are usually insignificant for the respondent. The respondent is asked to provide information and has little hope of receiving any immediate or direct benefit from this cooperation. Personal interviews may take place in a factory, in a homeowner's doorway, in an executive's office, in a shopping mall, or in other settings.

Advantages of Personal Interviewing:

The face-to-face interaction between interviewer and respondent has several characteristics that help researchers obtain complete and precise information. Personal interviews offer many advantages.

1. The Opportunity for Feedback

Personal interviews allow for feedback. For example, an employee who is reluctant to provide sensitive information about his workplace may be reassured by the interviewer that his answers will be strictly confidential. The interviewer may also provide feedback in clarifying any questions an employee or any other respondent has about the instructions or questions. Circumstances may dictate that at the conclusion of the interview, the respondent be given additional information concerning the purpose of the study (part of debriefing). This is easily accomplished in personal interview.

2. Probing Complex Questions

An important characteristic of personal interview is the opportunity to follow up, by probing. If a respondent's answer is brief or unclear, the researcher may ask for a clearer or more comprehensive explanation. Probing implies the verbal prompts made by the interviewer when the respondent must be motivated to communicate his or her answer more fully. Probing encourages respondents to enlarge on, clarify, or explain answers. Probing becomes all the more important when the questions don't have structured response categories. The complex question that cannot easily be asked in telephone or mail surveys can be handled by skillful interviewers.

3. Length of Interview

If the research objective requires an extremely lengthy questionnaire, personal interviews may be the only alternative. Generally, telephone interviews last fewer than 10 minutes, whereas a personal interview can be much longer, perhaps more than an hour. A rule of thumb for mail questionnaire is that it should not be more than six pages.

4. High Completion Rate

The social interaction between a well-trained interviewer and a respondent in personal interview increases the likelihood that the respondent will answer all items on the questionnaire. The respondent who grows bored with a telephone interview may terminate the interview at his or her discretion simply by hanging up the phone. A respondent's self- administration of a mail questionnaire requires more effort. Rather than writing a long explanation, the respondent may fail to complete some of the questions on the self- administered questionnaire. This will be an **item non- response** – that is, failure to provide an answer to a question. It is less likely to happen with an experienced interviewer and in a face to face situation.

5. Props and Visual Aids

Interviewing respondents face to face allows an investigator to show them a new product sample, a sketch of proposed office, or some other visual aid. The respondents can even taste samples of different products and can give their evaluations. Such an evaluation cannot be done in telephone interview or mail survey.

6. High Participation Rate

While some people are reluctant to participate in a survey, the presence of an interviewer generally increases the percentages of people willing to complete the interview. Respondents are not required to do any reading or writing – all they have to do is to talk. Most people enjoy sharing information and insights with friendly and sympathetic interviewers. Certainly, in personal interviews there is a higher rate of participation rate of the respondents compared with mail surveys and telephone interviews.

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7. Observation of the Non-Verbal Behavior

In a personal interview, the interviewer can catch the facial expressions, body movements, and, depending upon the goals of the study, the environment of the respondent. Such observations may supplement the verbal information.

8. Non-Literates can participate in Study

Since the respondent has neither to read nor to write, therefore, an illiterate or a functionally illiterate person can also take part in the survey study.

9. Interviewer can Prescreen Respondent

In order to ensure that the respondent fits the sampling criteria, the interviewer can do some prescreening of the respondent. In personal interview the interviewer makes it sure that only the relevant respondent provides the information. In case of mail survey, we are not sure who actually filled out the questionnaire, but in personal interview, the interview may be able to have some control over the environment of the information providers. In case there are other people around, he may make an excuse from other because he is interested in the true opinion of the sampled person.

10. CAPI – Computer Assisted Personal Interviewing

With the use of such modern technology the responses of the respondents can be entered into a portable microcomputer to reduce error and cost.

Disadvantages of Personal Interviewing:

1. High Cost

Personal interviews are generally more expensive than mail, internet, and telephone surveys. The geographic proximity of respondents, the length of the questionnaire, and the number of people who are non-respondents because they could not be contacted all influence the cost of the personal interviews. The training of the field interviewers, supervision, and other logistical support cost may add up the total cost of the study. People usually estimate the cost of personal interviews is usually 15 times higher than the mail survey

2. Scarcity of Highly Trained Interviewers

In case of a big study (especially a sponsored study) there shall be a need of highly trained interviewers, who are not easily available. Using unqualified and untrained interviewers are likely to have a negative effect on the quality of the data and the subsequent generalizations.

3. Lack of Anonymity of Respondent

Because the respondent in a personal interview is not anonymous therefore he/she may be reluctant to provide confidential information to another person. Though the interviewer provides all the assurance for the confidentiality of the information (by not asking the name or address) but the mere fact the respondent has been located, therefore he/she may not trust.

4. Callbacks – a Labor Intensive Work

When the person selected to be in the sample cannot be contacted on the first visit, a systematic procedure is normally initiated to call back at another time. **Callbacks** or attempts to re-contact individuals selected for the sample are the major means to reducing non-response error. It is a labor-intensive work and definitely increases the cost.

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5. Interviewer Influence

There is some evidence that the demographic characteristics of the interviewer influence respondents' answers. Respondent's sex, age, and physical appearance can have an effect on the responses of the respondent.

6. Interviewer Bias

Interviewer's personal likings and dis-likings, the environment, and cultural biases can affect the understanding of the responses, its recording, and its interpretation.

7. No Opportunity to Consult

The interview may take place anywhere – place of work, in the shopping mall, at home – the respondent may be unable to consult record, in case he/she has to do so for any specific question.

Less Standardized Wording

Despite the fact that the questions have been printed and have a specified order, these questions are read by the interviewer. The interviewers intentionally or unintentionally may not be able to use the standardized wording which may bias the data. Similarly, the order of the questions may be altered.

8. Limitations in Respondents' Availability and Accessibility

Some executive officers or VIPs may not be available or accessible to interviewers. Some of them may not be willing to talk to strangers for security reasons.

9. Some Neighborhoods are Difficult to Visit

Just for security reasons some neighborhoods may not allow outsiders to enter the premises. Even the formal permission may be denied because the residents don't want to contact any strangers.

Door to Door Interviews

These are the personal interviews conducted at respondent's home or place of work. It is likely to provide more representative sample of the population than mail questionnaire. Some people may prefer to give a verbal response rather than in writing. People who do not have telephones, who have unlisted numbers, or who are otherwise difficult to contact may be reached through door to door interviews.

Door to door interview may exclude individuals living in multiple dwelling units with security systems, such as high rise apartment dwellers, or executives who are too busy to grant a personal interview during business hours.

People, who are at home and willing to participate, especially if interviews are conducted in the day time, are somewhat more likely to be stay-at-home "moms" or retired people. These and other variables related to respondents' tendencies to stay at home may affect participation.

Intercept Interviews in Malls and Other High-Traffic Areas

Personal interviews conducted in shopping malls are referred to as mall intercept interviews. Interviewers generally stop and attempt to question shoppers at a central point within the mall or at the entrance. These are low cost. No travel is required to the respondent's home – instead the respondent comes to the interviewer, and thus many interviews can be conducted quickly. The incidence of refusal is high, however, because individuals may be in a hurry.

In mall intercept interviews the researcher must recognize that he or she should not be looking for representative sample of the total population. Each mall will have its own customer characteristics of customers.

Personal interviews in the shopping mall may be appropriate when demographic factors are not likely to influence the survey's findings or when target group is a special population segment, such as the parents of children of bike-riding age.

INTERCEPT INTERVIEWS IN MALLS AND OTHER HIGH-TRAFFIC AREAS

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Telephone Interviewing: Telephone interviewing has been a mainstay of commercial survey research. The quality of data obtained by telephone may be comparable to that collected in personal interviews. Respondents may even be more willing to provide detailed and reliable information on a variety of personal topics over the telephone than in personal interviews. Telephone surveys can provide representative samples of general population in most industrialized countries.

Central Location Interviewing: Research agencies and interviewing services typically conduct all telephone interviews from central location. WATS (Wide-Area Telecommunications Service) lines, provided by long distance telephone service at fixed rates, allow interviewers to make unlimited telephone calls throughout the entire country or within a specific geographic area. Such central location interviewing allows firms to hire staffs of professional interviewers and to supervise and control the quality of interviewing more effectively. When telephone interviews are centralized and computerized, the research becomes even more cost-effective.

Computer-Assisted Telephone Interviewing (CATI): Advances in computer technology allow responses to telephone interviews to be entered directly into a computer in a process known as **Computer Assisted Telephone Interviewing (CATI)**. Telephone interviewers are seated at computer terminals. A monitor displays the questionnaire, one question at a time, along with pre-coded possible responses to each question. The interviewer reads each question as it is shown on the screen. When the respondent answers, the interviewer enters the response into the computer, and it is automatically stored in the computer's memory when the computer displays the next question on the screen. A Computer Assisted Telephone Interviewing requires that answers to the questions be highly structured. A lot of computer programming facilitates telephone interviewing.

The Strengths of Telephone Interviewing:

1. High Speed:

The speed of data collection is a major advantage of telephone interviewing. For example, union officials who wish to survey members' attitudes toward a strike may conduct a telephone survey during the last few days of the bargaining process. Whereas data collection with mail or personal

interviews can take several weeks, hundreds of interviews can be conducted literally overnight. When the interviewer enters the respondents' answers directly into a computerized system, data processing can be done even faster.

2. **Saves Cost:** As the cost of personal interviews continues to increase, telephone interviews are becoming relatively inexpensive. It is estimated the cost of telephone interviewing is less than 25% of the door to door personal interviews.

3. **Callbacks:** An unanswered call, a busy signal, or a respondent who is not at home requires a callback. Telephone callbacks are substantially easier and less expensive than personal interview callbacks.

4. Can Use Computerized Random Digit Dialing

5. Expanded Geographic Area Coverage without Increasing the Cost

6. Uses fewer but highly Skilled Interviewers

7. Reduced Interviewer Bias

8. **Better Access to hard-to-reach respondents through repeated callbacks:** In some neighborhoods, people are reluctant to allow stranger to come inside their house, or even stop on the doorstep. The same people, however, may be preferably willing to cooperate with a telephone survey request. Likewise, interviewers may be somewhat reluctant to conduct face-to-face interviews in certain neighborhoods, especially during the evening hours. Telephone interviewing avoids these problems.

9. **Use Computer Assisted Telephone Interviewing (CATI):** Responses can be directly entered into computer file to reduce error and cost.

Weaknesses of Telephone Interviewing

1. Absence of Face-to-Face Contact:

Telephone interviews are more impersonal than face-to-face interviews. Respondents may answer embarrassing or confidential questions more willingly in a telephone interview than in a personal interview. People may be more comfortable to answer sensitive and threatening questions through mail surveys. Absence of face-to-face contact can be a liability. The interviewer and the respondent don't see each other what they are doing (Responding still responding when he/she is thinking and not speaking. Has the interviewer finished recording the information)?

2. Response Rate is lower than for Personal Interviews:

Some individuals refuse to participate in telephone interviews. Telephone researchers can run into several roadblocks when trying to obtain executives' cooperation at work. Participants find it easier to terminate a phone interview.

3. Lack of Visual Medium:

Since visual aids cannot be utilized in telephone interview, research that requires visual material cannot be conducted by phone.

4. Limited Duration:

Length of the interview is limited. Respondents who feel they have spent too much time in the interview will simply hang up. (A good rule of thumb is to plan telephone interviews to be approximately 10 minutes long).

5. Many Numbers are unlisted or not working

6. Less Participant Involvement:

Telephone surveys can result in less thorough responses, and those interviewed by phone find the experience to be less rewarding than a personal interview. Participants report less rapport with telephone interviewers than with personal interviewers.

Distracting Physical Environment:

Multiple phones distract the interview situation which may affect the quality of the data.

Self-Administered Questionnaires

The self-administered questionnaire has become ubiquitous in modern living. Service evaluations of hotels, restaurants, car dealerships, and transportation providers furnish ready examples. Often a short questionnaire is left to be completed by the participants in a convenient location or is packed with the product. Self-administered mail questionnaires are delivered not only through postal services, but also via fax and courier service. Other modalities include computer-delivered and intercept studies.

Mail Questionnaire

A mail survey is a self-administered questionnaire sent to respondents through the mail. This paper-and-pencil method has several advantages and disadvantages.

Advantages of Mail Questionnaire

1. **Geographic Flexibility:** Mail questionnaires can reach a geographically dispersed sample simultaneously and at a relatively low cost because interviewers are not required. Respondents in isolated areas or those who are otherwise difficult to reach (executives) can be contacted more easily by mail.
2. **Sample Accessibility:** Researchers can contact participants who may otherwise be inaccessible. Some people, such as major corporate executives and physicians, are difficult to reach in person or by phone, as gatekeeper's limit access. But the researchers can often access these special participants by mail or computer.
3. **Self-Administered Questionnaires save time:** Self-administered questionnaires can be widely distributed to a large number of employees, so organizational problems may be assessed quickly and inexpensively. Questionnaires may be administered during group meetings as well as in the class rooms. The researcher can establish rapport with the respondents, can stay there for any clarifications, and may also be for any debriefing.
4. **Saves Cost:** Mail questionnaires are relatively inexpensive compared to personal interviews and telephone surveys. However, these may not be so cheap. Most include a follow-up mailing, which requires additional postage and printing of additional questionnaires.
5. **Respondent Convenience:** Mail surveys and self-administered questionnaires can be filled out whenever the respondent has time. Thus, there is a better chance that respondents will take time to think about their response. Many hard-to-reach respondents place high value on responding to surveys at their own convenience and are best contacted by mail. In some situations, particularly in organizational research, mail questionnaires allow respondents time to collect facts (such as records of absenteeism) that they may not be able to recall without checking. In the case of household surveys, the respondents may provide more valid and factual information by checking with family members compared with if they are giving a personal interview.
6. **Anonymity:** Mail surveys are typically perceived as more impersonal, providing more anonymity than the other communication modes, including other methods for distributing self-administered questionnaires. Absence of interviewer can induce respondents to reveal sensitive or socially undesirable information.
7. **Standardized Questions:** Mail questionnaires are highly standardized, and the questions are quite structured.

Disadvantages of Mail Questionnaire

1. **Low Response Rate:** Mail questionnaire has very low rate of return of the filled questionnaires.
2. **Low Completion Rate:** There are chances that respondents leave many questions as unanswered, either because they did not understand the question or they avoid.
3. **Increases Cost:** The researcher keeps on waiting for the return. When enough response is not there, then the reminders are sent, and again there is a waiting time. With the reminders copies of the questionnaires are sent. All this adds to the cost of the study.
4. **Interviewer's Absence:** Respondent may have different interpretations of the questions. Due to the absence of the interviewer, the respondents are unable to get any help for needed clarifications.
5. **No Control on Question Order:** In a self-administered/mail questionnaire, the respondent usually reads the whole of the questionnaire prior to answering the questions. The latter questions may influence the answers to the earlier questions; thereby it is likely to bias the data. In interview the questionnaire remains in the hands of the interviewer, and the respondent does not know what question is likely to follow. Therefore, in interview there is a control in the question order.
6. **Cannot Use Lengthy Questionnaire:** Mail questionnaires vary considerably in length, ranging from extremely short postcard questionnaires to lengthy, multi-page booklets requiring respondents to fill thousands of answers. Lengthy questionnaires are usually avoided by the respondents. A general rule of thumb is that it should not exceed six pages.
7. **No Control over the Environment:** The researcher does not know about who filled the questionnaire
8. **Cannot Catch the Non-Verbal Behavior**
9. **Non-Literates cannot participate:** For participation in the mail/self-administered questionnaire related studies, the respondents have to be educated up to a certain level. Hence the non-educated people are in a way excluded from the study.

Increasing Response Rate

Here are some guidelines for increasing the response rate. Response rate is the number of questionnaires returned or completed, divided by the total number of eligible people who were contacted or asked to participate in the survey.

Cover Letter: The cover letter that accompanies the questionnaire or is printed on the first page of the questionnaire is an important means of inducing a reader to complete and return the questionnaire. In the letter tell why the study is important, who is sponsoring the study, how was the respondent selected, assuring the anonymity of the respondent could help in establishing rapport and motivating the respondent to respond.

A personalized letter addressed to a specific individual shows the respondent that he or she is important. Including an individually typed letter on letterhead versus printed form is an important element in increasing the response rate in mail surveys.

Money Helps: The respondent's motivation for returning a questionnaire may be increased by offering monetary incentives or premiums. Although pens, lottery tickets, and variety of premiums have been used, monetary incentives appear to be the most effective and least biasing incentive. It attracts the attention and creates a sense of obligation. Money incentive works for all income categories.

Interesting Questions: The topic of the research and thus the point of the questions cannot be manipulated without changing the problem definition. However, certain interesting questions can be added to the questionnaire, perhaps in the beginning, to stimulate the respondents' interest and to induce cooperation.

Lesson 22

SELF-ADMINISTERED QUESTIONNAIRES (CONTINUED)**Increasing Response Rate**

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Follow-Ups

Follow-up implies the communication of the message to respondents through different means for the return of questionnaire. After responses from the first wave of mailing begin to trickle-in, most studies use follow-up, reminder for getting the response. A follow-up may include a duplicate questionnaire or may merely be a reminder to return the original questionnaire. Multiple contacts almost always increase response rates. The more attempts made to reach people, the greater the chances of their responding.

Preliminary Notification

Advance notification, by either letter or telephone, that a questionnaire will be arriving has been successful in increasing the response rates in some situations. Advance notices that go out close to the questionnaire mailing time produce better results than those sent too far in advance. This technique pre-supposes a certain level of development of the country where such facilities are available. Even otherwise, it depends upon the nature of the study as well as the type of respondents selected for the study.

Survey Sponsorship

Sponsorship of the study makes a difference for motivating the respondents to return the questionnaires. It depends upon the goodwill of the sponsoring agency that can activate/deactivate

the respondent to fill the questionnaire and return it. There is some evidence that “official” and “respected” sponsorship increases the response rate. Sponsorship by well-known and prestigious organizations, such as universities or government agencies, may significantly influence response rates.

Return Envelopes

The inclusion of a stamped, self-addressed envelope encourages response because it simplifies questionnaire return.

Postage

The existing evidence shows that expedited delivery is very effective in increasing response rate. First class or third class mail, stamped mail or metered mail may make a difference.

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Personalization of the mailing has no clear-cut advantage in terms of improved response rates. Neither personal inside addresses nor individually signed cover letters significantly increased response rates; personally typed cover letters proved to be somewhat effective.

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The manipulation of one or two techniques independently of all others may do little to stimulate response. May be the researcher has to make use of all the possible techniques simultaneously, so that the response rate could be increased. Such an effort is referred to as Total Design Effort (TDE).

Email Surveys:

Questionnaires can be distributed via e-mail. E-mail is relatively new method of communication, and many individuals cannot be reached this way. However, certain projects lend themselves to, such as internal surveys of employees or satisfaction surveys of retail buyers who regularly deal with an organization via e-mail.

The benefits of an e-mail include speed of distribution, lower distribution and processing cost, faster turnaround time, more flexibility, and less handling of paper questionnaires.

Many respondents may feel that they can be more candid in e-mail than in person or on telephone, for the same reason they are candid on other self-administered questionnaires.

In many organizations, the employees know that their e-mails are not secure, that “eavesdropping” by a supervisor could occur. Further maintaining the respondent’s anonymity is difficult, because a reply to an e-mail message typically includes the sender’s address. Researchers designing e-mail surveys should assure respondents that their responses will be confidential.

Not all e-mail systems have the same capacity: some handle color and graphics well; others are limited to text. The extensive differences in the capabilities of respondents’ computers and email software limit the types of questions and the layout of the questionnaire.

Internet Surveys:

An internet survey is a self-administered questionnaire posted on a Web site. Respondents provide answers to questions displayed on screen by highlighting a phrase, clicking an icon, or keying in an answer.

Like any other survey, Internet surveys have both advantages and disadvantages.

Advantages of Internet Surveys

Speed and Cost Effectiveness: Internet survey allow the marketers to reach a large audience (possible a global one), to personalize the individual messages, and to secure confidential answers quickly and cost effectively. The computer to computer self-administered questionnaires eliminate the cost of paper, postage, data entry, and other administrative costs. Once an Internet questionnaire has been developed, the incremental cost of reaching additional respondents is marginal. Hence samples can be larger than with interviews or other types of self-administered questionnaires.

Visual Appeal and Interactivity: Surveys conducted on Internet can be interactive. The researcher can use more sophisticated lines of questioning based on the respondents' prior answers. Many of this interactive survey utilize color, sound, and animation, which may help to increase the respondents' cooperation and willingness to spend more time answering questions. The Internet is an excellent medium for the presentation of visual materials, such as photographs or drawings of product prototypes, advertisements, and movie trailers.

Respondent Participation and Cooperation: Participation in some Internet surveys occurs because computer users intentionally navigate to a particular Web site where questions are displayed. In some instances, individuals expect to encounter a survey at a Web site; in other cases it is totally unexpected.

Accurate Real-Time Data Capture: The computer to computer nature of Internet surveys means that each respondent's answers are entered directly into the researcher's computer as soon as the questionnaire is submitted. In addition, the questionnaire software may be programmed to reject improper data entry.

Real-time data capture allows for real-time data analysis. A researcher can review up-to-the-minute sample size counts and tabulation data from an Internet survey in real time.

Callbacks: When the sample for Internet survey is drawn from a consumer panel, it is easy to re-contact those who have not yet completed the questionnaire. Computer software can also identify the passwords of those respondents who completed only a portion of the questionnaire and send those people customized messages.

Personalized and Flexible Questioning: There is no interviewer in Internet surveys but the respondent interacts directly with the software on a Web site. In other words, the computer program asks questions in sequence determined by a respondent's previous answer. The questions appear on the computer screen, and answers are recorded by simply pressing a key clicking an icon, thus immediately entering the data into the computer's memory. This ability to sequence the question based on previous responses is a major advantage of computer-assisted surveys.

Respondent Anonymity: Respondents are more likely to provide sensitive information when they can remain anonymous. The anonymity of the Internet encourages respondents to provide honest answers to sensitive questions.

Most respondents do not feel threatening to enter information into the compute because of the absence of the interviewer. They may be assured that no human will ever see their individual responses.

Response Rate: Response rate can be increased by sending e-mail friendly reminders.

Disadvantages of Internet Surveys

All People cannot participate: Many people in the general public cannot access to Internet. And, all people with Internet access do not have the same level of technology. Many lack powerful computers or software that is compatible with advanced features programmed into many Internet questionnaires. Some individuals have minimum computer skills. They may not know how to navigate through and provide answers to an Internet questionnaire.

No Physical Incentive: Unlike mail surveys, Internet surveys do not offer the opportunity to send a physical incentive to the respondent.

SELECTING THE APPROPRIATE SURVEY RESEARCH DESIGN

The choice of communication method is not as complicated as it might appear. By comparing the research objectives with the strengths and weaknesses of each method, the researcher will be able to choose one that is suited to the needs. Nevertheless, there is no “best” form of survey. Each has advantages and disadvantages. A researcher who must ask highly confidential questions may conduct a mail survey, thus trading off the speed of data collection to avoid any possibility of interviewer bias.

To determine the appropriate technique, the researcher must ask questions such as “Is the assistance of an interviewer necessary? Are respondents likely to be interested in the issues being investigating? Will cooperation be easily attained? How quickly the information is needed? Will the study require a long complex questionnaire? How large is the budget?” The criteria – cost, speed, anonymity, and the like – may be different for each project.

If none of the choices turns out to be a particularly good fit, it is possible to combine the best characteristics of two or more alternatives into a *mixed mode*. Although this decision will incur the costs of the combined modes, the flexibility of tailoring a method to the unique need of the project is often an acceptable trade off.

LESSON 23

TOOLS FOR DATA COLLECTION

Broadly there are tools of data collection as part of communication surveys. These are:

1. Interview schedule
2. Questionnaire
3. Interview Guide

As discussed earlier interview schedule and questionnaires both are predesigned list of questions used for communication with the respondents. In the case of *interview schedule*, the list of questions remains in the hands of the interviewer who asks questions from the respondent, gets his/her response, and records the responses. *Questionnaire* is also a list of questions, which is handed over to the respondent, who reads the questions and records the answers himself. For purposes of convenience *questionnaire* will refer to both interview schedule as well as questionnaire.

Interview guide is list of topics that are to be covered during the course of interview. Interview guide is used for purposes of an in-depth interviewing. Questions on the topics are formulated on the spot. Most of the questions are open ended. The interviewer may not use the same wording for each respondent; the number of questions may be different; the sequence of questions may also be different.

Guidelines for Questionnaire Design

A survey is only as good as the questions it asks. Questionnaire design is one of the most critical stages in the survey research process. While common sense and good grammar are important in question writing, more is required in the art of questionnaire design. To assume that people will understand the questions is common error. People may not simply know what is being asked. They may be unaware of topic of interest, they may confuse the subject with something else, or the question may not mean the same thing to every respondent. Respondents may simply refuse to answer personal questions. Further, properly wording the questionnaire is crucial, as some problems may be minimized or avoided altogether if a skilled researcher composes the questions.

A good questionnaire forms an integrated whole. The researcher weaves questions together so they flow smoothly. He or she includes introductory remarks and instructions for clarification and measures each variable with one or more survey questions.

What should be asked?

The problem definition will indicate which type of information must be collected to answer the research question; different types of questions may be better at obtaining certain type of information than others.

1. Questionnaire Relevancy

A questionnaire is relevant if no unnecessary information is collected and if the information that is needed to solve the problem is obtained.

Asking the wrong or an irrelevant question is a pitfall to be avoided. If the task is to pinpoint compensation problems, for example, questions asking for general information about morale may be inappropriate. To ensure information relevancy, the researcher must be specific about data needs, and there should be a rationale for each item of information.

2. Questionnaire Accuracy

Once the researcher has decided what should be asked, the criterion of accuracy becomes of primary concern. Accuracy means that the information is reliable and valid. While experienced researchers believe that one should use simple, understandable, unbiased, unambiguous, and nonirritating words.

Obtaining accurate answer from respondents is strongly influenced by the researcher's ability to design a questionnaire that facilitates recall and that will motivate the respondent to cooperate. Therefore, avoid jargon, slang, and abbreviations. The respondents may not understand some basic terminology. Respondents can probably tell the interviewer whether they are married, single, divorced, separated, or widowed, but providing their "marital status" may present a problem. Therefore, asking somebody about his/her *marital status* while the person may not understand the meaning of marital status is likely to mess up the information. Words used in the questionnaire should be readily understandable to all respondents.

3. Avoid Ambiguity, Confusion, and Vagueness.

Ambiguity and vagueness plague most question writers. A researcher might make implicit assumptions without thinking of respondents' perspectives. For example, the question, "what is your income?" could mean weekly, monthly, or annual; family or personal; before taxes or after taxes; for this year or last year; from salary or from all sources. The confusion causes inconsistencies in how different respondents assign meaning to and answer the question.

Another source of ambiguity is the use indefinite words or response categories. Consider the words such as *often*, *occasionally*, *usually*, *regularly*, *frequently*, *many*, *good*, *fair*, and *poor*. Each of these words has many meanings. For one person, frequent reading of *Time* magazine may be reading six or seven issues a year; for another it may be two issues a year. The word *fair* has great variety of meanings; the same is true for many indefinite words.

4. Avoid Double-Barreled Questions

Make each question about one and only one. A double-barreled question consists of two or more questions joined together. It makes the respondent's answer ambiguous. For example, if asked, "Does this company have pension and health insurance benefits?" a respondent at the company with health insurance benefits only might answer either yes or no. The response has an ambiguous meaning and the researcher cannot be certain of the respondent's intentions. When multiple questions are asked in one question, the results may be exceedingly difficult to interpret.

5. Avoid Leading Questions

Make respondents feel that all responses are legitimate. Do not let them aware of an answer that the researcher wants. A leading question is the one that leads the respondent to choose one response over another by its wording. For example, the question, "you don't smoke, do you?" leads respondents to state that they do not smoke. "Don't you think that women should be empowered?" In most the cases the respondent is likely to agree with the statement.

6. Avoid Loaded Questions

Loaded questions suggest a socially desirable answer or are emotionally charged. "Should the city government repair all the broken streets?" Most of the people are going to agree with this question simply because this is highly socially desirable. A question which may be challenging the traditionally set patterns of behavior may be considered as emotionally charged i.e. it is loaded with such material which may hit the emotions of the people. Look at some behaviors associated with masculinity in Pakistani society. Let us ask a husband "Have you ever been beaten up by your wife?" Straight away this question may be considered to be a challenge to the masculinity of the person. Hence it may be embarrassing for the person to admit such an experience. Therefore, even if the husband was beaten up by his wife, he might give a socially desirable answer.

7. Avoid Burdensome Questions that may Tax the Respondent's Memory

A simple fact of human life is that people forget. Researchers writing questions about past behavior or events should recognize that certain questions may make serious demand on the respondent's memory.

"How did you feel about your brother when you were 6 years old?" It may be very difficult to recall something from the childhood.

8. Arrange Questions in a Proper Sequence

The order of question, or the question sequence, may serve several functions for the researcher. If the opening questions are interesting, simple to comprehend, and easy to answer, respondent's cooperation and involvement can be maintained throughout the questionnaire. If respondent's curiosity is not aroused at the outset, they can become disinterested and terminate the interview.

Sequencing specific questions before asking about broader issues is a common cause of question order bias. In some situations, it may be advisable to ask general question before specific question to obtain the freest opinion of the respondent. This procedure, known as **funnel technique**, allows the researcher to understand the respondent's frame of reference before asking specific questions about the level of respondent's information and intensity of his or her opinions.

9. Use Filter Question, if Needed

Asking a question that doesn't apply to the respondent or that the respondent is not qualified to answer may be irritating or may cause a biased response. Including filter question minimizes the chance of asking questions that are inapplicable. Filter question is that question which screens out respondents not qualified to answer a second question. For example, the researcher wants to know about the bringing up of one's children. "How much time do you spend playing games with your oldest child?" What if the respondent is unmarried? Even if the respondent is married but does not have the child. In both these situations the question is inapplicable to him/her. Before this question the person may put a filter question whether or not the respondent is married.

10. Layout of the questionnaire

There are two format or layout issues: the overall physical layout of the questionnaire and the **format of questions and responses**. **Good lay out and physical attractiveness is crucial in mail, Internet, and other self-administered questionnaires.** For different reason, it is also important to have a good layout in questionnaires designed for personal and telephone interviews. Give each question a number and put identifying information on questionnaire. Never cramp questions together or create a confusing appearance.

Make a cover sheet or face sheet for each, for administrative use. Put the time and date of the interview, the interviewer, the respondent identification number, and interviewer's comments and observations on it. Give interviewers and respondents instructions on the questionnaire. Print instructions in a different style from question to distinguish them. Lay out is important for mail questionnaires because there is no friendly interviewer to interact with the respondent. Instead the questionnaire's appearance persuades the respondents. In mail surveys, include a polite, professional cover letter on letterhead stationery, identifying the researcher and offering a telephone number for any questions. Always end with "Thank you for your participation."

ADMINISTRATION OF QUESTIONNAIRE**Increasing Response Rate**

Here are some guidelines for increasing the response rate. Response rate is the number of questionnaires returned or completed, divided by the total number of eligible people who were contacted or asked to participate in the survey.

Cover Letter

The cover letter that accompanies the questionnaire or is printed on the first page of the questionnaire is an important means of inducing a reader to complete and return the questionnaire. In the letter tell why the study is important, who is sponsoring the study, how was the respondent selected, assuring the anonymity of the respondent could help in establishing rapport and motivating the respondent to respond.

A personalized letter addressed to a specific individual shows the respondent that he or she is important. Including an individually typed letter on letterhead versus printed form is an important element in increasing the response rate in mail surveys.

Money Helps

The respondent's motivation for returning a questionnaire may be increased by offering monetary incentives or premiums. Although pens, lottery tickets, and variety of premiums have been used, monetary incentives appear to be the most effective and least biasing incentive. It attracts the attention and creates a sense of obligation. Money incentive works for all income categories.

Interesting Questions

The topic of the research and thus the point of the questions cannot be manipulated without changing the problem definition. However, certain interesting questions can be added to the questionnaire, perhaps in the beginning, to stimulate the respondents' interest and to induce cooperation.

Follow-Ups

Follow-up implies the communication of the message to respondents through different means for the return of questionnaire. After responses from the first wave of mailing begin to trickle-in, most studies use follow-up, reminder for getting the response. A follow-up may include a duplicate questionnaire or may merely be a reminder to return the original questionnaire. Multiple contacts almost always increase response rates. The more attempts made to reach people, the greater the chances of their responding.

Preliminary Notification

Advance notification, by either letter or telephone, that a questionnaire will be arriving has been successful in increasing the response rates in some situations. Advance notices that go out close to the questionnaire mailing time produce better results than those sent too far in advance. This technique pre-supposes a certain level of development of the country where such facilities are available. Even otherwise, it depends upon the nature of the study as well as the type of respondents selected for the study.

Survey Sponsorship

Sponsorship of the study makes a difference for motivating the respondents to return the questionnaires. It depends upon the goodwill of the sponsoring agency that can activate/deactivate

the respondent to fill the questionnaire and return it. There is some evidence that “official” and “respected” sponsorship increases the response rate. Sponsorship by well-known and prestigious organizations, such as universities or government agencies, may significantly influence response rates.

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To determine the appropriate technique, the researcher must ask questions such as “Is the assistance of an interviewer necessary? Are respondents likely to be interested in the issues being investigating? Will cooperation be easily attained? How quickly the information is needed? Will the study require a long complex questionnaire? How large is the budget?” The criteria – cost, speed, anonymity, and the like – may be different for each project.

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Lesson 25

INTERVIEWING

A personal interviewer administering a questionnaire door to door, a telephone interviewer calling from a central location, an observer counting pedestrians in a shopping mall, and others involved in the collection of data and the supervision of that process are all **fieldworkers**. The activities they perform vary substantially. The supervision of data collection for a mail survey differs from the data collection in an observation study. Nevertheless, there are some basic issues in all kinds of fieldwork. Just for convenience, in this session we shall focus on the interviewing process conducted by personal interviewers. However, many of the issues apply to all fieldworkers, no matter what their specific setting.

Who conducts the fieldwork?

Data collection in a sponsored study is rarely carried out by the person who designs the research project. For a student, depending upon the sample size, data collection is usually done by the student **himself/herself**. However, the data collection stage is crucial, because the research project is no better than the data collected in the field. Therefore, it is important that the research administrator selects capable people who may be entrusted to collect the data.

There are Field Interviewing Services, who specialize in data gathering. These agencies perform door-to-door surveys, central location telephone interviewing, and other forms of fieldwork for fee. These agencies typically employ field supervisors who oversee and train interviewers, edit questionnaires completed in the field, and confirm that the interviews have been conducted.

Whether the research administrator hires in-house interviewers or selects a field interviewing service, it is desirable to have fieldworkers meet certain job requirements. Although the job requirements for different types of surveys vary, normally interviewers should be healthy, outgoing, honest, accurate, responsible, motivated, and of pleasing appearance well-groomed and properly dressed.

An essential part of the interviewing process is establishing rapport with the

respondent. **In-House Training**

After personnel are selected, they must be trained. The training that the interviewer will receive after being selected by a company may vary from virtually no training to one week program. Almost always there will be a **briefing session** on the particular project.

The objective of training is to ensure that the data collection instrument is administered uniformly by all fieldworkers. The goal of training session is to ensure that each respondent is provided with common information. If the data are collected in a uniform manner from all respondents, the training session will have been success.

More extensive training programs are likely to cover the following topics:

1. How to make initial contact with the respondent and secure the interview?
2. How to ask survey questions?
3. How to probe?
4. How to record responses? How to terminate the interview?

The Role of the Interviewer

Survey research interviewing is a specialized kind of interviewing. As with most interviewing, its goal is to obtain accurate information from another person.

The survey interview is a social relationship. Like other social relationships, it involves social roles, norms, and expectations. The interview is a short-term, secondary social interaction between two strangers with the explicit purpose of one person's obtaining specific information from the other. The social roles are those of the interviewer and the interviewee or respondent. Information is obtained in a structured conversation in which the interviewer asks prearranged questions and records answers, and the respondent answers.

The role of interviewer is difficult. They obtain cooperation and build rapport, yet remain neutral and objective. They encroach on respondents' time and privacy for information that may not benefit the respondents. They try to reduce embarrassment, fear, and suspicion so that respondents feel comfortable revealing information. They explain the nature of the survey research or give hints about social roles in an interview. Good interviewers monitor the pace and direction of the social interaction as well as content of the answers and the behavior of the respondents.

Survey interviewers are nonjudgmental and do not reveal their opinions, verbally or nonverbally. If the respondent asks for an interviewer's opinion, he or she politely redirects the respondent and indicate that such questions are inappropriate.

Stages of an Interview

Making Initial Contact and Securing the Interview

The interview proceeds through stages, beginning with introduction and entry. Interviewers are trained to make appropriate opening remarks that will convince the person that his or her cooperation is important.

Asslaam-o-Alaykum, my name is _____ and I am working for a National Survey Company. We are conducting a survey concerning "women empowerment." I would like to get a few of your ideas.

For the initial contact in a telephone interview, the introduction might be:

Asslaam-o-Alaykum, my name is _____. I am calling from Department of Social Research, Virtual University.

By indicating that telephone call is a long distance, interviewers attempt to capitalize on the fact that most people feel a long-distance call is something special, unusual, or important. Giving one's personal name personalizes the call.

Personal interviewers may carry a letter of identification that will indicate that the study is bona fide research project and not a salesman's call. The name of the research agency is used to assure the respondent that the caller is trustworthy.

Asking the Questions

The purpose of the interview is, of course, to have the interviewer ask questions and record the respondent's answers. Training in the art of stating questions can be extremely beneficial, because interviewer bias can be a source of considerable error in survey research.

There are five major principles for asking questions:

- Ask the questions exactly as they are worded in the questionnaire.
- Read each question very slowly.
- Ask the question in the order in which they are presented in the questionnaire.
- Repeat questions that are misunderstood or misinterpreted.

Although interviewers are generally trained in these procedures, when working in the field many interviewers do not follow them exactly. Do not take shortcuts when the task becomes monotonous.

Interviewers may shorten questions or rephrase unconsciously when they rely on their memory of the question rather than reading the question as it is worded.

If the respondents do not understand a question, they will usually ask for some clarification. The recommended procedure is to repeat the question, or if the respondent does not understand a word, the interviewer should respond with “just whatever it means to you.

Often the respondents volunteer information relevant to a question that is supposed to be asked at a later point in the research. In this situation, the response should be recorded under the question that deals specifically with that subject. Then rather than skip the question that was answered out of sequence, the interviewers should be trained to say something like “We have briefly discussed this, but let me ask you” By asking every question, the interviewer can be sure that complete answers are recorded.

Probing

Probing means the verbal prompts made by field worker when the respondent must be motivated to communicate his or her answer or to enlarge on, clarify or explain an answer. Probing may be needed for two types of situations. First, it is necessary when the respondent must be motivated to enlarge on, clarify, or explain his or her answer. The interviewer must encourage the respondent to clarify or expand on answers by providing a stimulus that will not suggest the interviewer’s own ideas. The ability to probe with neutral stimuli is the mark of an experienced interviewer. Second, probing may be necessary in situations in which the respondent begins to ramble or lose track of the question. In such cases the respondent must be led to focus on specific content of the interview and to avoid irrelevant and unnecessary information. Probing is also needed when the interviewer recognizes an irrelevant or inaccurate answer.

He interviewer has several possible probing tactics to choose from, depending on the situation:

- *Repetition of the question.* The respondent who remains completely silent may not have understood the question or may not have decided how to answer it. Mere repetition may encourage the respondent to answer in such cases. For example, if the question is “What is there that you do not like about your supervisor?” and the respondent does not answer, the interviewer may probe: “just to check, is there anything you do not like about your supervisor?”
- *An expectant pause.* If the interviewer believes the respondent has more to say, the “silent probe,” accompanied by an expectant look may motivate the respondent to gather his/her thoughts and give a complete response.
- *Repetition of the respondent’s reply.* As the interviewer records the response, he or she may repeat the respondent’s reply verbatim. This may stimulate the respondent to expand on the answer.
- *Neutral questions or comments.* Asking neutral question may indicate the type of information that the interviewer is seeking. For example, if the interviewer believes that the respondent’s motives should be clarified, he or she might ask, “Why do you feel that way?” If the interviewer feels that there is a need to clarify a word or phrase, then he/she might ask, “What do you mean by _____?”

Recording the Responses

The rules for recording responses to closed ended questions vary with the specific question. The general rule, however, is to place a check in the box that correctly reflects the respondent’s answer.

The general instructions for recording answers to open-ended response questions is to record the answer verbatim, a task that is difficult for most people. Some of the suggestions are:

- Record responses during the interview.
- Use the respondent’s own words.
- Do not summarize or paraphrase the respondent’s answer.
- Include everything that pertains to the question objectives.
- Include all your probes.

Terminating the Interview

Fieldworkers should not close the interview before all the information has been secured. The interviewer whose departure is hasty will not be able to record those spontaneous comments respondents sometimes offer after all formal questions have been asked. Avoiding hasty departures is also a matter of courtesy.

Fieldworkers should also answer to the best of their ability any questions the respondent has concerning the nature and purpose of the study. Always leave by observing the local cultural customs. “Don’t burn your bridges.” Because the fieldworker may be required to re-interview the respondent at some future time, he or she should leave the respondent with positive feeling about having cooperated in a worthwhile undertaking. It is extremely important thank the respondent for his or her cooperation.

The interviewer then goes to a quiet and private place to edit the questionnaire and record other details such as the date, time, and place of interview; a thumbnail sketch of the respondent and interview situation, the respondent’s attitude; and any unusual circumstances. The interviewer also records personal feelings and anything that was suspected.

Principles of Interviewing the Basics:

Have integrity and be honest. This is the cornerstone of all professional inquiry, regardless of its purpose.

Have patience and tact. Interviewers ask for information from people they do not know. Thus, all the rules of human relations that apply to inquiry situations – patience, tact, courtesy – apply “in spades” to interviewing.

Have attention to accuracy and detail. Among the greatest interviewing “sins” are inaccuracy and superficiality, for the professional analyst can misunderstand, and in turn mislead, a client. Do not record the answer unless you fully understand it yourself. Probe for clarification and detailed full answers.

Exhibit a real interest in the inquiry at hand, but keep your opinions to yourself. Impartiality is imperative.

Be a good listener. Some interviewers talk too much, wasting time when respondents could be supplying more pertinent facts or opinions on the topic.

Keep the inquiry and respondents’ responses confidential. Do not discuss the studies you are doing with relatives, friends, or associates. Never quote one respondent’s opinion to another.

Respect others’ rights. Survey research depends on the goodwill of others to provide information. There should be no coercion. Impress on prospective respondents that their cooperation is important and valuable.

Interview Bias

- Information obtained during interview should be as free as possible of bias.
- Bias could be introduced by the interviewer, interviewee, or the situation. Interviewer bias falls into six categories:

Interviewer Bias

1. Interviewer could bias the data if proper rapport is not established – Errors by the respondent – forgetting, embarrassment, misunderstanding, or lying because of the presence of others.

2. Unintentional errors or interviewer sloppiness – contacting the wrong person, misreading a question, omitting questions, reading questions in the wrong order, recording wrong answer, or misunderstanding the respondent.
3. Intentional subversion by the interviewer – purposeful alteration of answers, omission or rewording of questions, or choice of an alternative respondent.
4. Influence due to the interviewer's expectations about a respondent's appearance, living situation, or other answers.
5. Failure of an interviewer to probe or to probe properly.
6. Influence on the answers due to the interviewer's appearance, tone, attitude, reactions to answers, or comments made outside of the interview schedule.

Interviewee Bias

- Errors made by the respondent –
- 1. Interviewees can bias the data when they do not come out with their true opinion but provide information that they think what the interviewer expects of them or would like to hear.
- 2. They do not understand the question, they may feel difficult or hesitant to clarify.
- 3. Some interviewees may be turned off because of the personal liking, or the dress of the interviewer, or the manner in which questions are put. So, they may not provide truthful answers.
- 4. Some may provide socially undesirable answers.

Situational Bias

- Situational biases in terms of:
- 1. Non-participants – Unwillingness or inability to participate. Bias the sample.
- 2. Trust levels and rapport established by different interviewers. Elicit answers of different degrees of openness.
- 3. The physical setting of the interview. Respondent may not feel comfortable to be interviewed at work.

Some Tips for Interviewing

- Know the culture of the people in advance.
- Appearance – wear acceptable dress.
- Pleasantness and flexibility.
- Carry the letter of authority.
- Establish credibility and rapport. Motivating individuals to respond.
- Familiarity with the questionnaire.
- Following the question wording/ question order
- Recording responses exactly.
- Probing for responses.
- Closing the interview. No false promises. Also, don't burn your bridges.
- Edit the questionnaire in the first available opportunity.

ETHICAL ISSUES IN RESEARCH- I

Ethics are norms or standards of behavior that guide moral choices about our behavior and our relationships with others. The goal of ethics in research is to ensure that no one is harmed or suffers adverse consequences from research activities. This objective is usually achieved. However, unethical activities are pervasive and include violating nondisclosure agreements, breaking respondent confidentiality, misrepresenting results, deceiving people, invoicing irregularities, avoiding legal liability, and more.

As discussed earlier, ethical questions are philosophical questions. There is no general agreement among philosophers about the answers to such questions. However, the rights and obligations of individuals are generally dictated by the norms of society. Societal norms are codes of behavior adopted by a group; they suggest what a member of a group ought to do under given circumstances. Nevertheless, with changing situations people continue differing with each other whereby societal norms may undergo changes. Codes and regulations guide researchers and sponsors. Review boards and peer groups help researchers examine their research proposals for ethical dilemmas. Responsible researchers anticipate ethical dilemmas and attempt to adjust the design, procedures, and protocols during the planning process rather than treating them as afterthought. Ethical research requires personal integrity from the researcher, the project manager, and the research sponsor.

Codes of ethic applicable at each stage of the research

Goal: To ensure that no one is harmed or suffers adverse consequences from research activities.

Unethical activities

- Violating nondisclosure agreements.
- Breaking respondent confidentiality.
- Misrepresenting results.
- Deceiving people.
- Invoicing irregularities.
- Avoiding legal liability.

Ethical Issues

- Remain to be issues.
- Local norms suggest what ought to be done under the given circumstances.
- Codes of ethics developed to guide researchers and sponsors.
- Review Boards and peer groups help sorting out ethical dilemmas.

Anticipate ethical dilemmas

- Adjust the design, procedures, and protocols accordingly.
- Research ethics require personal integrity of the researcher, the project manager, and research sponsor.

Parties in Research

Mostly three parties:

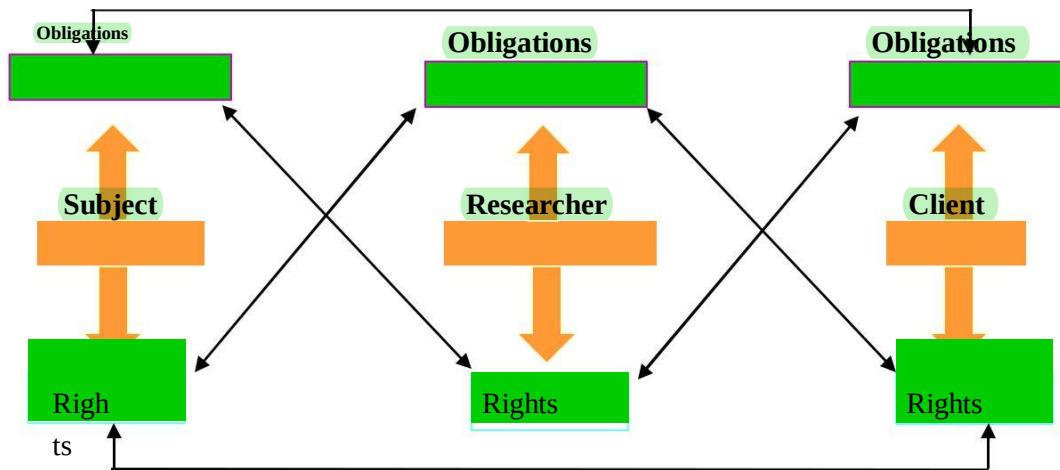
- The researcher
- The sponsoring client (user)
- The respondent (subject)
- Interaction requires ethical questions.
- Each party expects certain rights and feels certain obligations.

General Rights and Obligations of Parties Concerned

In most research situations, three parties are involved: the *researcher*, the *sponsoring client (user)*, and the *respondent (subject)*. The interaction of each of these parties with one or

both of the other two identifies a series of ethical questions. Consciously or unconsciously, each party expects certain rights and feels certain obligations towards the other parties.

Interaction of rights and obligations of parties in research



Ethical Treatment of Participants

When ethics are discussed in research design, we often think first about protecting the rights of the participant, respondent, or subject. Whether data are gathered in an experiment, interview, observation, or survey, the respondent has many rights to be safeguarded. In general, the research must be designed so that a respondent does not suffer physical harm, discomfort, pain, embarrassment, or loss of privacy. To safeguard against these, the researcher should follow three guidelines;

1. Explain study benefits.
2. Explain respondent rights and protections.
3. Obtain informed consent.

Benefits:

Whenever direct contact is made with a respondent, the researcher should discuss the study's benefits, being careful to neither overstate nor understate the benefits. An interviewer should begin an introduction with his or her name, the name of the research organization, and a brief description of the purpose and benefit of the research. This puts the respondent at ease, let them know to whom they are speaking, and motivates them to answer questions truthfully. In short, knowing why one is being asked questions improve cooperation through honest disclosure of purpose. Inducements to participate, financial or otherwise, should not be disproportionate to the task or presented in a fashion that results in coercion.

Sometimes the actual purpose and benefits of the study or experiment must be concealed from the respondents to avoid introducing bias. The need for concealing objectives leads directly to the problem of deception.

ETHICAL ISSUES IN RESEARCH-II

Ethics are norms or standards of behavior that guide moral choices about our behavior and our relationships with others. The goal of ethics in research is to ensure that no one is harmed or suffers adverse consequences from research activities. This objective is usually achieved. However, unethical activities are pervasive and include violating nondisclosure agreements, breaking respondent confidentiality, misrepresenting results, deceiving people, invoicing irregularities, avoiding legal liability, and more.

Deception:

Deception occurs when the respondents are told only part of the truth or when the truth is fully compromised. Some believe this should never occur. Others suggest two reasons for deception: (1) to prevent biasing the respondents before the survey or experiment and (2) to protect the confidentiality of a third party (e.g. the sponsor). Deception should not be used in an attempt to improve response rates.

The benefits to be gained by deception should be balanced against the risks to the respondents. When possible, an experiment or interview should be redesigned to reduce the reliance on deception. Use of deception is inappropriate unless deceptive techniques are justified by the study's expected scientific, educational, or applied value and equally effective alternatives that do not use deception are not feasible. And finally, the respondents must have given their informed consent before participating in the research.

Informed Consent:

Securing informed consent from respondents is a matter of fully disclosing the procedures of the proposed survey or other research design before requesting permission to proceed with the study. There are exceptions that argue for a signed consent form. When dealing with children, it is wise to have a parent or other person with legal standing sign a consent form.

If there is a chance the data could harm the respondent or if the researchers offer any limited protection of confidentiality, a signed form detailing the types of limits should be obtained. For most business research, oral consent is sufficient.

In situations where respondents are intentionally or accidentally deceived, they should be debriefed once the research is complete.

Debriefing:

It involves several activities following the collection of data:

- Explanation of any deception.
- Description of the hypothesis, goal, or purpose of the study.
- Post study sharing of the results.
- Post study follow-up medical or psychological attention.

First, the researcher shares the truth of any deception with the participants and all the reasons for using deception in the context of the study's goals. In cases where severe reactions occur, follow-up medical or psychological attention should be provided to continue to ensure the participants remain unharmed by the research.

Even when the research does not deceive the respondents, it is a good practice to offer them follow-up information. This retains the goodwill of the respondent, providing an incentive to participate in future research projects. For surveys and interviews, respondents can be offered a brief report of the findings. Usually they would not ask for additional information.

For experiments, all participants should be debriefed in order to put the experiment in context. Debriefing usually includes a description of the hypothesis being tested and the purpose of the study. Participants who were not deceived still benefit from the debriefing session. They will be able to understand why the experiment was created. The researchers also gain important insight into what the participants thought about during and after the experiment.

To what extent do debriefing and informed consent reduce the effects of deception? Research suggests that the majority of the respondents do not resent temporary deception and may have more positive feelings about the value of the research after debriefing than those who didn't participate in the study.

Rights to Privacy

All individuals have right to privacy, and researchers must respect that right. The privacy guarantee is important not only to retain validity of the research but also to protect respondents. The confidentiality of the survey answers is an important aspect of the respondents' right to privacy.

Once the guarantee of confidentiality is given, protecting that confidentiality is essential. The researcher protects the confidentiality in several ways;

- Obtaining signed nondisclosure documents.
- Restricting access to respondent identification.
- Revealing respondent information only with written consent.
- Restricting access to data instruments where the respondent is identified.
- Nondisclosure of data subsets.

Privacy is more than confidentiality. A **right to privacy** means one has the right to refuse to be interviewed or to refuse to answer any question in an interview. Potential participants have a right to privacy in their own homes including not admitting researchers and not answering telephones. To address these rights, ethical researchers do the following:

- Inform respondents of their right to refuse to answer any questions or participate in the study.
- Obtain permission to interview respondents.
- Schedule field and phone interviews.
- Limit the time required for participation.
- Restrict observation to public behavior only.

The obligation to be truthful: When a subject willingly agrees to participate, it is generally expected that he or she will provide truthful answers. Honest cooperation is main obligation of the respondent or the subject.

Ethics and the Sponsor

There are also ethical considerations to keep in mind when dealing with the research client or sponsor has the right to receive ethically conducted research.

Confidentiality of Sponsor

Some sponsors wish to undertake research without revealing themselves. They have a right to several types of confidentiality, including sponsor nondisclosure, purpose nondisclosure, and findings nondisclosure.

Companies have the right to dissociate themselves from sponsorship of a research project. This type of confidentiality is called **sponsorship nondisclosure**. Due to sensitive nature of the management dilemma or the research question, sponsor may hire an outside consulting or research firm to complete research project. This is often done when a company is testing a new product idea, to avoid potential consumers from being influenced by company's current image or industry standing.

Purpose nondisclosure involves protecting the purpose of the study or its details. A research sponsor may be testing a new idea that is not yet patented and may not want the competition to know its plans. It may be investigating employee complaints and may not want to spark union activity. Finally, even if a sponsor feels no need to hide its identity or the study's purpose, most sponsors want the research data and findings to be confidential; at least until the management

decision is made. Thus sponsors usually demand and receive **findings nondisclosure** between themselves or their researchers and any interested but unapproved parties.

Right to Quality Research

An important ethical consideration is the sponsor's **right to quality** research. This right entails:

- Providing research design appropriate for the research question.
- Maximizing the sponsor's value for the resources expended.
- Providing data handling and reporting techniques appropriate for the data collected.

Sponsor's Ethics

Occasionally, research specialists may be asked by the sponsors to participate in unethical behavior. Compliance by the researcher would be a breach of ethical standards. Some examples to be avoided are;

- Violating respondent confidentiality.
- Changing data or creating false data to meet the desired objective.
- Changing data presentation or interpretations.
- Interpreting data from a biased perspective.
- Omitting sections of data analysis and conclusions.
- Making recommendations beyond the scope of data collected.

Researchers and Team Members

Another ethical responsibility of researchers is their team's safety as well as their own. The responsibility for ethical behavior rests with the researcher who, along with assistants, is charged with protecting the anonymity of both the sponsor and the respondent.

Safety: It is the researcher's responsibility to design a project so the safety of all interviewers, surveyors, experimenters, or observers is protected. Several factors may be important to consider in ensuring a researcher's **right to safety**.

Ethical behavior of Assistants: Researchers should require ethical compliance from team members just as sponsors expect ethical behavior from researcher. Assistants are expected to carry out the sampling plan, to interview or observe respondents without bias, and to accurately record all necessary data.

Protection of Anonymity: Researchers and assistants should protect the confidentiality of the sponsor's information and anonymity of the respondents. Each researcher handling data should be required to sign a confidentiality and nondisclosure statement.

Professional Standards

Various standards of ethics exist for the professional researcher. Many corporations, professional associations, and universities have **code of ethics**. These codes of ethic have to be enforced.

Things we observe are the observable realities, which could be physical or abstract. For purposes of identification of reality, we try to give a name to it. By using the name, we communicate with others and over time it becomes part of our language.

A concept is a generalized idea about a class of objects, attributes, occurrences, or processes that has been given a name. In other words, a concept is an idea expressed as a symbol or in words. Natural science concepts are often expressed in symbolic forms. Most social science concepts are expressed as words. Words, after all, are symbols too; they are symbols we learn with language. Height is a concept with which all of you are familiar. In a sense, a language is merely an agreement to represent ideas by sound or written characters that people learned at some point in their lives. Learning concepts and theory is like learning language.

Lesson 28

DATA ANALYSIS

Once the data begins to flow in, attention turns to data analysis. If the project has been done correctly, the analysis planning is already done. Back at the research design stage or at least by the completion of the proposal or the pilot test, decisions should have been made about how to analyze the data.

During the analysis stage, several interrelated procedures are performed to summarize and rearrange the data. The goal of most research is to provide information. There is a difference between raw data and information.

Information refers to a body of facts that are in a format suitable for decision making, whereas **data** are simply recorded measures of certain phenomenon. The raw data collected in the field must be transformed into information that will answer the sponsor's (e.g. manager's) questions. The conversion of raw data into information requires that the data be edited and coded so that the data may be transferred to a computer or other data storage medium.

If the database is large, there are many advantages to utilizing a computer. Assuming a large database, entering the data into computer follows the coding procedure.

Editing

Occasionally, a fieldworker makes a mistake and records an improbable answer (e.g., birth year: 1843) or interviews an ineligible respondent (e.g., someone too young to qualify). Seemingly contradictory answers, such as "no" to automobile ownership but "yes" to an expenditure on automobile insurance, may appear on a questionnaire. There are many problems like these that must be dealt with before the data can be coded. Editing procedures are conducted to make the data ready for coding and transfer to data storage.

Editing is the process of checking and adjusting the data for omissions, legibility, and consistency. Editing may be differentiated from coding, which is the assignment of numerical scales or classifying symbols to previously edited data.

The purpose of editing is to ensure the completeness, consistency, and readability of the data to be transferred to data storage. The editor's task is to check for errors and omissions on the questionnaires or other data collection forms.

The editor may have to reconstruct some data. For instance, a respondent may indicate weekly income rather than monthly income, as requested on the questionnaire. The editor must convert the information to monthly data without adding any extraneous information. The editor "should bring to light all hidden values and extract all possible information from a questionnaire, while adding nothing extraneous."

Field Editing

In large projects, field supervisors are often responsible for conducting preliminary field edits. The purpose of field editing the same day as the interview is to catch technical omissions (such as a blank page), check legibility of the handwriting, and clarify responses that are logically or conceptually inconsistent. If a daily field editing is conducted, a supervisor who edits completed questionnaires will frequently be able to question the interviewers, who may be able to recall the interview well enough to correct any problems. The number of "no answers," or incomplete answers can be reduced with a rapid follow-up simulated by a field edit. The daily edit also allows fieldworkers to re-contact the respondent to fill in omissions before the situation has changed. The field edit may also indicate the need for further training of interviewers.

In-House Editing:

Although almost simultaneous editing in the field is highly desirable, in many situations (particularly with mail questionnaires), early reviewing of the data is not possible. In-house editing rigorously investigates the results of data collection.

Editing for Consistency:

The in-house editor's task is to ensure that inconsistent or contradictory responses are adjusted and that answers will not be a problem for coders and keyboard punchers. Consider the situation in which a telephone interviewer has been instructed to interview only registered voters that requires voters to be 18 years old. If the editor's reviews of a questionnaire indicate that the respondent was only 17 years of age, the editor's task is to eliminate this obviously incorrect sampling unit. Thus, in this example, the editor's job is to make sure that the sampling unit is consistent with the objectives of the study. Editing requires checking for logically consistent responses. The in-house editor must determine if the answers given by a respondent to one question are consistent with those given to other, related questions. Many surveys utilize filter questions or skip questions that direct the sequence of questions, depending upon respondent's answer. In some cases, the respondent will have answered a sequence of questions that should not have been asked. The editor should adjust these answers, usually to "no answer" or "inapplicable," so that the responses will be consistent.

Editing for Completeness: In some cases, the respondent may have answered only the second portion of a two-part question. An in-house editor may have to adjust the answers to the following question for completeness.

Does your organization have more than one Internet Web site? Yes ____ No. ____

If a respondent checked neither "yes" nor "No", but indicated three Internet Web sites, the editor may check the "yes" to ensure that this answer is not missing from the questionnaire.

Item Non-response: It is a technical term for an unanswered question on an otherwise complete questionnaire. Specific decision rules for handling this problem should be meticulously outlined in the editorial instructions. In many situations, the decision rule will be to do nothing with the unanswered question: the editor merely indicates in item non-response by writing a message instructing the coder to record a "missing value" or blank as the response. However, in case the response is necessary then the editor uses the **plug value**. The decision rule may to "plug in" an average or neutral value in each case of missing data. A blank response in an interval scale item with a mid- point would be to assign the mid-point in the scale as the response to that particular item. Another way is to assign to the item the mean value of the responses of all those who have responded to that particular item. Another choice is to give the item the mean of the responses of this particular respondent to all other questions measuring the variables. Another decision rule may be to alternate the choice of the response categories used as plug values (e.g. "yes" the first time, "no" the second time, "yes" the third time, and so on).

The editor must also decide whether or not an entire questionnaire is "usable." When a questionnaire has too many (say 25%) answers missing, it may not be suitable for the planned data analysis. In such a situation, the editor simply records the fact that a particular incomplete questionnaire has been dropped from the sample.

Editing Questions Answered out of Order: Another situation an editor may face is the need to rearrange the answers to an open-ended response to a question. For example, a respondent may have provided the answer to a subsequent question in his answer to an earlier open-ended response question. Because the respondent had already clearly identified his answer, the interviewer may have avoided asking the subsequent question. The interviewer may have wanted to avoid hearing "I have already answered that earlier" and to maintain rapport with the respondent and therefore skipped the question. To make the response appear in the same order as on other questionnaires, the editor may remove the out-of-order answer to the section related to the skipped question.

Coding

Coding involves assigning numbers or other symbols to answers so the responses can be grouped into limited number of classes or categories. The classifying of data into limited categories sacrifices some data detail but is necessary for efficient analysis. Nevertheless, it is recommended that try to keep the data in raw form so far it is possible. When the data have been entered into the computer you can always ask the computer to group and regroup the categories. In case the data have been entered in the compute in grouped form, it will not be possible to disaggregate it.

Although codes are generally considered to be numerical symbols, they are more broadly defined as the rules for interpreting, classifying, and recording data. Codes allow data to be processed in a computer. Researchers organize data into fields, records, and files. A **field** is a collection of characters (a character is a single number, letter of the alphabet, or special symbol such as the question mark) that represent a single type of data. A **record** is collection of related fields. A **file** is a collection of related records. File, records, and fields are stored on magnetic tapes, floppy disks, or hard drives.

Researchers use a coding procedure and codebook. A **coding procedure** is a set of rules stating that certain numbers are assigned to variable attributes. For example, a researcher codes males as 1 and females as 2. Each category of variable and missing information needs a code. A **codebook** is a document (i.e. one or more pages) describing the coding procedure and the location of data for variables in a format that computers can use.

When you code data, it is very important to create a well-organized, detailed codebook and make multiple copies of it. If you do not write down the details of the coding procedure, or if you misplace the codebook, you have lost the key to the data and may have to recode the data again.

Researchers begin thinking about a coding procedure and a codebook before they collect data. For example, a survey researcher pre-codes a questionnaire before collecting the data. Pre-coding means placing the code categories (e.g. 1 for male, 2 for female) on the questionnaire. Sometimes to reduce dependence on codebooks, researchers also place the location in the computer format on the questionnaire.

If the researcher does not pre-code, his or her first step after collecting and editing of data is to create a codebook. He or she also gives each case an identification number to keep track of the cases. Next, the researcher transfers the information from each questionnaire into a format that computers can read.

Code Construction

When the question has a fixed-alternative (closed ended) format, the number of categories requiring codes is determined during the questionnaire design stage. The codes 8 and 9 are conventionally given to “don’t know” (DK) and “no answer” (NA) respectively. However, many computer program fields recognize a blank field or a certain character symbol, such as a period (.), as indicating a missing value (no answer).

There are two basic rules for code construction. First, the coding categories should be **exhaustive** – that is, coding categories should be provided for all subjects or objects or responses. With a categorical variable, such as sex, making categories exhaustive is not a problem. However, when the response represents a small number of subjects or when the responses might be categorized in a class not typically found, there may be a problem.

Second, the coding categories should also be **mutually exclusive** and **independent**. This means that there should be no overlap between the categories, to ensure that a subject or response can be placed in only one category. This frequently requires that an “other” code category be included, so that the categories are all inclusive and mutually exclusive. For example, managerial span of control might be coded 1, 2, 3, 4, and “5 or more.” The “5 or more” category ensures everyone a place in a category.

When a questionnaire is highly structured, pre-coding of the categories typically occurs before the data are collected. In many cases, such as when researchers are using open-ended response questions, a

framework for classifying responses to questions cannot be established before data collection. This situation requires some careful thought concerning the determination of categories after editing process has been completed. This is called post-coding or simply *coding*. The purpose of **coding open-ended response questions** is to reduce the large number of individual responses to a few general categories of answers that can be assigned numerical scores. Code construction in these situations necessarily must reflect the judgment of the researcher. A major objective in code-building process is to accurately transfer the meaning from written answers to numeric codes.

Code Book

A book identifying each variable in a study and its position in the data matrix. The book is used to identify a variable's description, code name, and field. Here is a sample:

Q/V No.	Field/ col. No.	Code values
--	1-5	Study number
-	6	City
		1 = Lahore
		2 = Rawalpindi
		3 = Karachi
	7 -9	Interview No.
Sex	10	1 = Male
		2 = Female
Age	11-12	Actual
Education	13	1 = Non literate
		2 = Literate

Production Coding

Transferring the data from the questionnaire or data collection form after the data have been collected is called production coding. Depending upon the nature of the data collection form, codes may be written directly on the instrument or on a special coding sheet.

Data Entries

Use of scanner sheets for data collection may facilitate the entry of the responses directly into the computer without manual keying in the data. In studies involving highly structured paper questionnaires, an **Optical scanning system** may be used to read material directly to the computer's memory into the computer's memory. Optical scanners process the marked-sensed questionnaires and store the answers in a file.

Cleaning Data

The final stage in the coding process is the error checking and verification, or **"data cleaning"** stage, which is a check to make sure that all codes are legitimate. Accuracy is extremely important when coding data. Errors made when coding or entering data into a computer threaten the validity of measures and cause misleading results. A researcher who has perfect sample, perfect measures, and no errors in gathering data, but who makes errors in the coding process or in entering data into a computer, can ruin a whole research project.

DATA TRANSFORMATION AND CLEANING

Once the data begins to flow in, attention turns to data analysis. If the project has been done correctly, the analysis planning is already done. Back at the research design stage or at least by the completion of the proposal or the pilot test, decisions should have been made about how to analyze the data.

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If a respondent checked neither "yes" nor "No", but indicated three Internet Web sites, the editor may check the "yes" to ensure that this answer is not missing from the questionnaire.

Item Non-response: It is a technical term for an unanswered question on an otherwise complete questionnaire. Specific decision rules for handling this problem should be meticulously outlined in the editorial instructions. In many situations, the decision rule will be to do nothing with the unanswered question: the editor merely indicates in item non-response by writing a message instructing the coder to record a "missing value" or blank as the response. However, in case the response is necessary then the editor uses the **plug value**. The decision rule may to "plug in" an average or neutral value in each case of missing data. A blank response in an interval scale item with a mid- point would be to assign the mid-point in the scale as the response to that particular item. Another way is to assign to the item the mean value of the responses of all those who have responded to that particular item. Another choice is to give the item the mean of the responses of this particular respondent to all other questions measuring the variables. Another decision rule may be to alternate the choice of the response categories used as plug values (e.g. "yes" the first time, "no" the second time, "yes" the third time, and so on).

The editor must also decide whether or not an entire questionnaire is "usable." When a questionnaire has too many (say 25%) answers missing, it may not be suitable for the planned data analysis. In such a situation, the editor simply records the fact that a particular incomplete questionnaire has been dropped from the sample.

Editing Questions Answered out of Order: Another situation an editor may face is the need to rearrange the answers to an open-ended response to a question. For example, a respondent may have provided the answer to a subsequent question in his answer to an earlier open-ended response question. Because the respondent had already clearly identified his answer, the interviewer may have avoided asking the subsequent question. The interviewer may have wanted to avoid hearing "I have already answered that earlier" and to maintain rapport with the respondent and therefore skipped the question. To make the response appear in the same order as on other questionnaires, the editor may remove the out-of-order answer to the section related to the skipped question.

Coding

Coding involves assigning numbers or other symbols to answers so the responses can be grouped into limited number of classes or categories. The classifying of data into limited categories sacrifices some data detail but is necessary for efficient analysis. Nevertheless, it is recommended that try to keep the data in raw form so far it is possible. When the data have been entered into the computer you can always ask the computer to group and regroup the categories. In case the data have been entered in the compute in grouped form, it will not be possible to disaggregate it.

Although codes are generally considered to be numerical symbols, they are more broadly defined as the rules for interpreting, classifying, and recording data. Codes allow data to be processed in a computer. Researchers organize data into fields, records, and files. A **field** is a collection of characters (a character is a single number, letter of the alphabet, or special symbol such as the question mark) that represent a single type of data. A **record** is collection of related fields. A **file** is a collection of related records. File, records, and fields are stored on magnetic tapes, floppy disks, or hard drives.

Researchers use a coding procedure and codebook. A **coding procedure** is a set of rules stating that certain numbers are assigned to variable attributes. For example, a researcher codes males as 1 and females as 2. Each category of variable and missing information needs a code. A **codebook** is a document (i.e. one or more pages) describing the coding procedure and the location of data for variables in a format that computers can use.

When you code data, it is very important to create a well-organized, detailed codebook and make multiple copies of it. If you do not write down the details of the coding procedure, or if you misplace the codebook, you have lost the key to the data and may have to recode the data again.

Researchers begin thinking about a coding procedure and a codebook before they collect data. For example, a survey researcher pre-codes a questionnaire before collecting the data. Pre-coding means placing the code categories (e.g. 1 for male, 2 for female) on the questionnaire. Sometimes to reduce dependence on codebooks, researchers also place the location in the computer format on the questionnaire.

If the researcher does not pre-code, his or her first step after collecting and editing of data is to create a codebook. He or she also gives each case an identification number to keep track of the cases. Next, the researcher transfers the information from each questionnaire into a format that computers can read.

Code Construction

When the question has a fixed-alternative (closed ended) format, the number of categories requiring codes is determined during the questionnaire design stage. The codes 8 and 9 are conventionally given to “don’t know” (DK) and “no answer” (NA) respectively. However, many computer program fields recognize a blank field or a certain character symbol, such as a period (.), as indicating a missing value (no answer).

There are two basic rules for code construction. First, the coding categories should be **exhaustive** – that is, coding categories should be provided for all subjects or objects or responses. With a categorical variable, such as sex, making categories exhaustive is not a problem. However, when the response represents a small number of subjects or when the responses might be categorized in a class not typically found, there may be a problem.

Second, the coding categories should also be **mutually exclusive** and **independent**. This means that there should be no overlap between the categories, to ensure that a subject or response can be placed in only one category. This frequently requires that an “other” code category be included, so that the categories are all inclusive and mutually exclusive. For example, managerial span of control might be coded 1, 2, 3, 4, and “5 or more.” The “5 or more” category ensures everyone a place in a category.

When a questionnaire is highly structured, pre-coding of the categories typically occurs before the data are collected. In many cases, such as when researchers are using open- ended response questions, a framework for classifying responses to questions cannot be established before data collection. This situation requires some careful thought concerning the determination of categories after editing process has been completed. This is called post-coding or simply **coding**. The purpose of **coding open-ended response questions** is to reduce the large number of individual responses to a few general categories of answers that can be assigned numerical scores. Code construction in these situations necessarily must reflect the judgment of the researcher. A major objective in code-building process is to accurately transfer the meaning from written answers to numeric codes.

Code Book

A book identifying each variable in a study and its position in the data matrix. The book is used to identify a variable's description, code name, and field. Here is a sample:

Q/V No.	Field/ col. No.	Code values
--	1-5	Study number
-	6	City
		1 = Lahore
		2 = Rawalpindi
		3 = Karachi
	7 -9	Interview No.
Sex	10	1 = Male
		2 = Female
Age	11-12	Actual
Education	13	1 = Non literate
		2 = Literate

Production Coding

Transferring the data from the questionnaire or data collection form after the data have been collected is called production coding. Depending upon the nature of the data collection form, codes may be written directly on the instrument or on a special coding sheet.

Data Entries

Use of scanner sheets for data collection may facilitate the entry of the responses directly into the computer without manual keying in the data. In studies involving highly structured paper questionnaires, an **Optical scanning system** may be used to read material directly to the computer's memory into the computer's memory. Optical scanners process the marked-sensed questionnaires and store the answers in a file.

Cleaning Data

The final stage in the coding process is the error checking and verification, or **"data cleaning"** stage, which is a check to make sure that all codes are legitimate. Accuracy is extremely important when coding data. Errors made when coding or entering data into a computer threaten the validity of measures and cause misleading results. A researcher who has perfect sample, perfect measures, and no errors in gathering data, but who makes errors in the coding process or in entering data into a computer, can ruin a whole research project.



DATA SCALING

Data transformation is the process of changing data from their original form to a format that is more suitable to perform a data analysis that will achieve the research objectives. Researchers often modify the values of a scalar data or create new variables. For example, many researchers believe that response bias will be less if interviewers ask consumers for their year of birth rather than their age, even though the objective of the data analysis is to investigate respondents' age in years. This does not present a problem for the research analyst, because a simple data transformation is possible. The raw data coded at birth year can be easily transformed to age by subtracting the birth year from the current year.

Collapsing or combining categories of a variable is a common data transformation that reduces the number of categories. For example, five categories of Likert scale response categories to a question may be combined like: the “strongly agree” and the “agree” response categories are combined. The “strongly disagree” and the “disagree” response categories are combined into a single category. The result is the collapsing of the five-category scale down to three.

Creating new variables by re-specifying the data numeric or logical transformations is another important data transformation. For example, Likert summated scale reflect the combination of scores (raw data) from various attitudinal statements. The summative score for an attitude scale with three statements is calculated as follows:

$$\text{Summative Score} = \text{Variable 1} + \text{Variable 2} + \text{Variable 3}$$

This calculation can be accomplished by using simple arithmetic or by programming a computer with a data transformation equation that creates the new variable “summative score.”

The researchers have created numerous different scales and indexes to measure social phenomenon. For example, scales and indexes have been developed to measure the degree of formalization in bureaucratic organization, the prestige of occupations, the adjustment of people in marriage, the intensity of group interaction, the level of social activity in a community, and the level of socio-economic development of a nation.

Keep it in mind that every social phenomenon can be measured. Some constructs can be measured directly and produce precise numerical values (e.g. family income) . Other constructs require the use of surrogates or proxies that indirectly measure a variable (e.g. job satisfaction). Second, a lot can be learned from measures used by other researchers. We are fortunate to have the work of thousands of researchers to draw on. It is not always necessary to start from a scratch. We can use a past scale or index, or we can modify it for our own purposes. The process of creating measures for a construct evolves over time. Measurement is an ongoing process with constant change; new concepts are developed, theoretical definitions are refined, and scales or indexes that measure old or new constructs are improved.

Indexes and Scales

Scales and indexes are often used interchangeably. One researcher's scale is another's index. Both produce ordinal- or interval- level measures of variable. To add to the confusion, scale and index techniques can be combined in one measure. Scales and indexes give a researcher more information about variables and make it possible to assess the quality of measurement. Scales and indexes increase reliability and validity, and they aid in **data reduction**; that is condense and simplify the information that is collected.

A **scale** is a measure in which the researcher captures the intensity, direction, level, or potency of a variable construct. It arranges responses or observation on a continuum. A scale can use single indicator or multiple indicators. Most are at the ordinal level of measurement. An **index** is a measure in which a researcher adds or combines several distinct indicators of a construct into a single score.

This composite score is often a simple sum of multiple indicators. It is used for content or convergent validity. Indexes are often measured at the interval or ratio level.

Researchers sometimes combine the features of scales and indexes in a single measure. This is common when a researcher has several indicators that are scales. He or she then adds these indicators together to yield a single score, thereby an index.

Unidimensionality: It means that all the items in a scale or index fit together, or measure a single construct. Unidimensionality says: If you combine several specific pieces of information into a single score or measure, have all the pieces measure the same thing. (each sub dimension is part of the construct's overall content).

For example, we define the construct “feminist ideology” as a general ideology about gender. Feminist ideology is a highly abstract and general construct. It includes a specific beliefs and attitudes towards social, economic, political, family, sexual relations. The ideology's five belief areas parts of a single general construct. The parts are mutually reinforcing and together form a system of beliefs about dignity, strength, and power of women.

Index Construction

You may have heard about a consumer price index (CPI). The CPI, which is a measure of inflation, is created by totaling the cost of buying a list of goods and services (e.g. food, rent, and utilities) and comparing the total to the cost of buying the same list in the previous year. An **index** is combination of items into a single numerical score. Various components or subgroups of a construct are each measured, and then combined into one measure.

There are many types of indexes. For example, if you take an exam with 25 questions, the total number of questions correct is a kind of index. It is a composite measure in which each question measures a small piece of knowledge, and all the questions scored correct or incorrect are totaled to produce a single measure.

One way to demonstrate that indexes are not a very complicated is to use one. Answer yes or no to the seven questions that follow on the characteristics of an occupation. Base your answers on your thoughts regarding the following four occupations: long-distance truck driver, medical doctor, accountant, telephone operator. Score each answer 1 for yes and 0 for no.

1. Does it pay good salary?
2. Is the job secure from layoffs or unemployment?
3. Is the work interesting and challenging?
4. Are its working conditions (e.g. hours, safety, time on the road) good?
5. Are there opportunities for career advancement and promotion?
6. Is it prestigious or looked up to by others?
7. Does it permit self-direction and the freedom to make decisions?

Total the seven answers for each of the four occupations. Which had the highest and which had the lowest score? The seven questions are our operational definition of the construct good occupation. Each question represents a subpart of our theoretical definition.

Creating indexes is so easy that it is important to be careful that every item in the index has face validity. Items without face validity should be excluded. Each part of the construct should be measured with at least one indicator. Of course, it is better to measure the parts of a construct with multiple indicators.

Another example of an index is college quality index. Our theoretical definition says that a high - quality college has six distinguished characteristics: (1) fewer students per faculty member, (2) a highly-educated faculty, (3) more books in the library, (4) fewer students dropping out of college, (5) more students who go to advanced degrees, and (6) faculty members who publish books or scholarly articles. We score 100 colleges on each item, and then add the score for each to create an index score of college quality that can be used to compare colleges.

Indexes can be combined with one another. For example, in order to strengthen the college quality index. We add a sub-index on teaching quality. The index contains eight elements: (1) average size of classes, (2) percentage of class time devoted to discussion, (3) number of different classes each faculty member teaches, (4) availability of faculty to students outside the classroom, (5) currency and amount of reading assigned, (6) degree to which assignments promote learning, (7) degree to which faculty get to know each student, and (8) student ratings of instruction. Similar sub-index measures can be created for other parts of the college quality index. They can be combined into a more global measure of college quality. This further elaborates the definition of a construct “quality of college.”

Weighting

An important issue in index construction is whether to weight items. Unless it is otherwise stated, assume that an index is un-weighted. Likewise, unless we have a good reason for assigning different weights, use equal weights. A weighted index gives each item equal weight. It involves adding up the items without modification, as if each were multiplied by 1 (or – 1 for negative items that are negative).

Scoring and Score Index

In one of our previous discussions we had tried to measure job satisfaction. It was operationalized with the help of dimensions and elements. We had constructed number of statements on each element with 5 response categories using Likert scale i.e. strongly agree, agree, undecided, disagree, and strongly disagree. We could score each of these items from 1 to 5 depending upon the degree of agreement with the statement. The statements have been both positive as well as negative. For positive statements, we can score straight away from 5 to 1 i.e. strongly agree to strongly disagree. For the negative statements, we have to reverse the score i.e. 1 for “strongly agree,” 2 for “agree,” 3 for “undecided” to 4 for “disagree,” and 5 for “strongly disagree.” Reason being that negative multiplied by a negative becomes positive i.e. a negative statement and a person strongly disagreeing with it implies that he or she has a positive response so we give a score of 5 in this example. In our example, let us say there were 23 statements measuring for different elements and dimensions measuring job satisfaction. When on each statement the respondent could get a minimum score of 1 and a maximum score of 5, on 23 statements a respondent could get a minimum score of (23 X 1) and a maximum score of (23 X 5) 115. In this way, the score index ranges from 23 to 115, the lower end of the score index showing minimum job satisfaction and upper end as the highest job satisfaction. In reality we may not find any on the extremes, rather the respondents could be spread along this continuum. We could use the raw scores of independent and dependent variables and apply appropriate statistics for testing the hypothesis. We could also divide the score index into different categories like high “job satisfaction” and “low satisfaction” for presentation in a table. We cross-classify job satisfaction with some other variable, apply appropriate statistics for testing the hypothesis.

DATA PRESENTATION

Tables and graphs (pictorial presentation of data) may simplify and clarify the research data. Tabular and graphic representation of data may take a number of forms, ranging from computer printouts to elaborate pictographs. The purpose of each table or graph, however, is to facilitate the summarization and communication of the meaning of the data.

Although there are a number of standardized forms for presenting data in table or graphs, the creative researcher can increase the effectiveness of particular presentation. Bar charts, pie charts, curve diagrams, pictograms, and other graphic forms of presentation create a strong visual impression.

The proliferation of computer technology in business and universities has greatly facilitated tabulation and statistical analysis. Commercial packages eliminate the need to write a new program every time you want to tabulate and analyze data with a computer. SAS, Statistical Package for the Social Sciences (SPSS), SYSTAT, Epi. Info. And MINITAB is commonly used statistical packages. These user-friendly packages emphasize statistical calculations and hypothesis testing for varied types of data. They also provide programs for entering and editing data. Most of these packages contain sizeable arrays of programs for descriptive analysis and univariate, bivariate, and multivariate statistical analysis.

Results with one variable Frequency Distribution

Several useful techniques for displaying data are in use. The easiest way to describe the numerical data of one variable is with a frequency distribution. It can be used with nominal-, ordinal-, interval-, or ratio-level data and takes many forms. For example, we have data of 400 students. We can summarize the data on the gender of the students at a glance with raw count or a *frequency distribution*

Table 1: Frequency distribution of students

Gender	Frequency	Percent
Male	300	75
Female	100	25
Total	400	100

We can present the same information in a graphic form. Some common types of graphic presentations are the *histograms*, *bar chart*, and *pie chart*. Bar charts or graphs are used for discrete variables. They can have vertical or horizontal orientation with small space between the bars. The terminology is not exact, but histograms are usually upright bar graphs for interval or ratio data.

Presentation of data in these forms lays emphasis on visual representation and graphical techniques over summary statistics. Summary statistics may obscure, conceal, or even misrepresent the underlying structure of the data. Therefore, it is suggested that data analysis should begin with visual inspection.

The presented data has to be interpreted. The purpose of interpretation is to explain the meanings of the data so that we can make inferences and formulate conclusions. Therefore, **interpretation** refers to making inferences pertinent to the meaning and implications of the research investigation and drawing conclusions. In order for interpretation, the data have to be meaningfully analyzed. For purposes of analysis the researchers use statistics. The word *statistics* has several meanings. It can mean a set of collected numbers (e.g. numbers telling how many people living in a city) as well as a branch of

applied mathematics used to manipulate and summarize the features of numbers. Social researchers use both types of statistics. Here, we focus on the second type – ways to manipulate and summarize numbers that represent data from research project.

Descriptive statistics describe numerical data. They can be categorized by the number of variables involved: univariate, bivariate, or multivariate (for one, two, and three or more variables). Univariate statistics describe one variable.

Researchers often want to summarize the information about one variable into a single number. They use three measures of central tendency, or measures of the center of the frequency distribution: mean, median and mode, which are often called averages (a less precise and less clear way to say the same thing). The *mode* is simply the most common or frequently occurring number. The *median* is the middle point. The *mean* also called the arithmetic average, is the most widely used measure of central tendency. A particular central tendency is used depending upon the nature of the data.

Bivariate Tables

The bivariate contingency table is widely used. The table is based on cross-tabulation (cross-classification); that is the cases are organized in the table on the basis of two variables at the same time.

A contingency table is formed by cross- tabulating the two or more variables. It is contingent because the cases in each category of a variable get distributed into each category of a second variable. The table distributes cases into categories of multiple variables at the same time and shows how the cases, by the category of one variable, are “contingent upon” the categories of the other variables.

Constructing Percentage Tables

It is to construct a percentage table, but there are ways to make it look professional. Let us take two variables like the age of the respondents and their attitude towards “women empowerment.” Assuming that age affects the attitude towards women empowerment let us hypothesize: the lower the age, the higher the favorable attitude towards “women empowerment.” The age range of the respondents is 25 to 70, and the attitude index has three categories of “highly favorable,” “medium favorable,” and “low favorable.” The age variable has so many categories that making a table with that number becomes unwieldy and meaningless. Therefore, we regroup (recode) the age categories into three i.e. under 40 years, 40 – 60 years, and 61 + years.

Univariate table for age

• Table 2: Age of the respondents

• Age (Yrs.)	Frequency	Percent
• Under 40	1000	33.3
• 40 – 60	1000	33.3
• 61 +	1000	33.3
• Total	3000	100

Univariate table for attitude

- Table 3: Attitude towards women empowerment

Attitude	Frequency	Percent
Hi Favorable	1100	37
Med Favorable	1050	35
Lo Favorable	850	28
Total	3000	100

Bivariate table

- Table 4: Age by attitude towards women empowerment

Level of attitude	Age (in years)							
	under 40		40 –60		61 +		Total	
	F.	%	F.	%	F	%	F	%
Hi Favorable	600	60	300	30	200	20	1100	37
Med. Favorable	300	30	500	50	250	25	1050	35
Lo Favorable	100	10	200	20	500	50	850	28
Total	1000	100	1000	100	1000	100	3000	100

Lesson 32

THE PARTS OF THE TABLE

1. Give each table a number.
2. Give each table a title, which names variables and provides background information
3. Label the row and columns variables and give name to each of the variable categories.
4. Include the totals of the columns and rows. These are called *marginals*. They equal the univariate frequency distribution for the variable.
5. Each number or place that corresponds to the intersection of a category for each variable is a *cell of a table*.
6. The numbers with the labeled variable categories and the totals are called the *body of the table*.
7. If there is missing information, report the number of missing cases near the table to account for all original cases.

Researchers convert raw count tables into percentages to see bi-variate relationship. There are three ways to percentage a table: by row, by column, and for the total. The first two are often used and show relationship.

Is it best to percentage by row or column? Either could be appropriate. A researcher's hypothesis may simply looking at row percentages or the column percentages. Here, the hypothesis is that age affects attitude, so column percentages are most helpful. Whenever one factor in a cross-tabulation can be considered the cause of the other, percentage will be most illuminating if they are computed in the direction of the causal factor.

Reading a percentage Table: Once we understand how table is made, reading it and figuring out what it says are much easier. To read a table, first look at the title, the variable labels, and any background information. Next, look at the direction in which percentages have been computed – in rows or columns.

Researchers read percentage tables to make comparisons. Comparisons are made in the opposite direction from that in which percentages are computed. A rule of thumb is to compare across rows if the table is percentage down (i.e. by column) and to compare up and down in columns if the table is percentage across (i.e. by row).

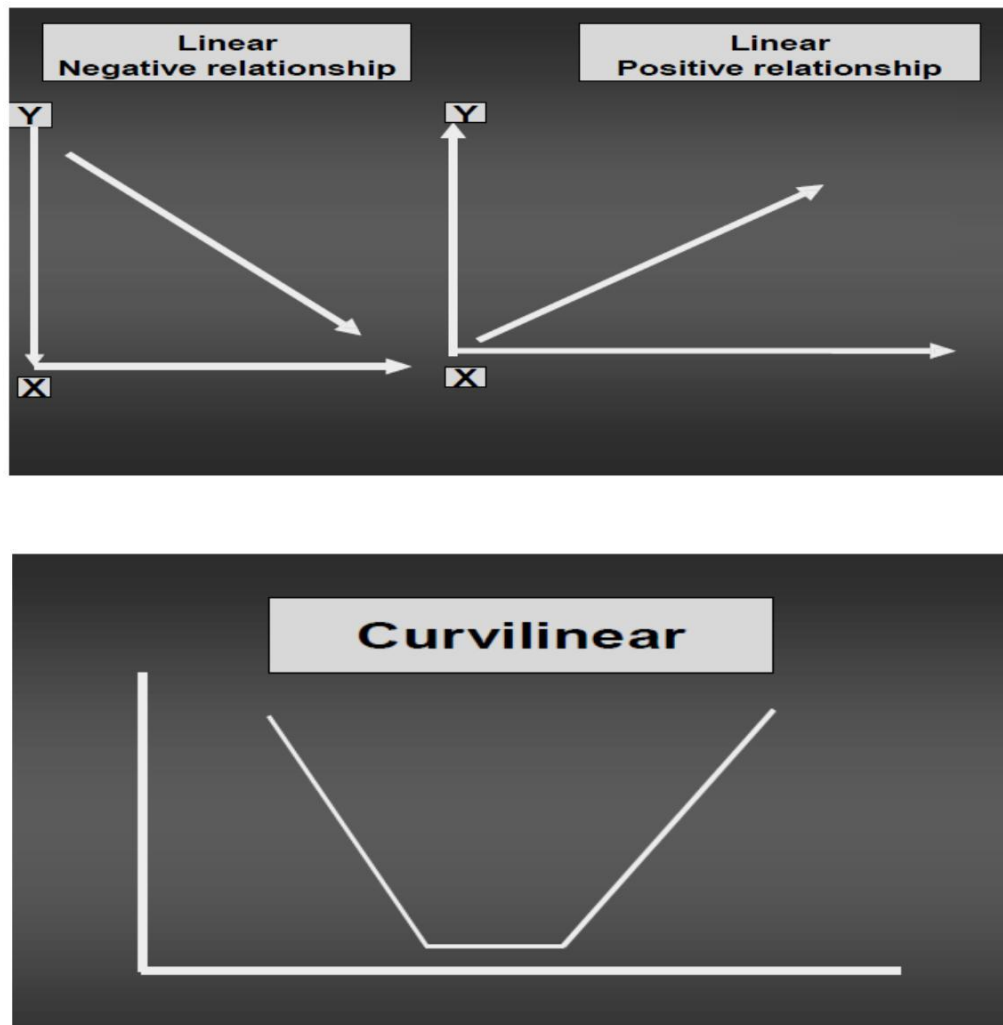
It takes practice to see a relationship in a percentage table. If there is no relationship in a table, the cell percentages look approximately equal across rows or columns. A linear relationship looks like larger percentages in the diagonal cells. If there is curvilinear relationship, the largest percentages form a pattern across cells. For example, the largest cells might be the upper right, the bottom middle, and the upper left. It is easiest to see a relationship in a moderate-sized table (9 to 16 cells) where most cells have some cases (at least five cases are recommended) and the relationship is strong and precise.

Linear relationship

• **Table 4:** Age by attitude towards women empowerment

Level of attitude	Age (in years)							Total
	under 40		40 –60		61 +		F	
	F.	%	F.	%	F	%		
% Hi Favorable	600		60	300	30	200	20	
1100		37						
Med. Favorable	300	30	500	50	250	25	1050	28
Lo Favorable	100	10	200	20	500	50	850	28
Total	1000	100	1000	100	1000	100	3000	100

- **Larger percentages in the diagonal cells**



A simple way to see strong relationships is to circle the largest percentage in each row (in row percentage tables) or columns (for column-percentage tables) and see if a line appears.

A simple way to see strong relationship is to circle the largest percentage in applicable row or column and see if a line appears

• Table 4: Age by attitude towards women empowerment

Age (in years)								
Level of attitude	under 40		40 –60		61 +		Total	
	F.	%	F.	%	F	%	F	%
Hi Favorable	600	60	300	30	200	20	1100	37
Med. Favorable	300	30	500	50	250	25	1050	35
Lo Favorable	100	10	200	20	500	50	800	28
Total	1000	100	1000	100	1000	100	3000	100

The circle-the-largest-cell rule works – with one important caveat. The categories in the percentages table must be ordinal or interval. The lowest variable categories begin at the bottom left. If the categories in a table are not ordered the same way, the rule does not work.

Statistical Control

Showing an association or relationship between two variables is not sufficient to say that an independent variable *causes* a dependent variable. In addition to temporal order and association, a researcher must eliminate alternative explanations – explanations that can make the hypothetical relationship spurious. Experimental researchers do this by choosing a research design that physically controls potential alternative explanations for results (i.e. that threaten internal validity).

In non-experimental research, a researcher controls for alternative explanations with statistics. He or she measures possible alternative explanations with *control variables*, and then examines the control variables with multivariate tables and statistics that help him or her to decide whether a bivariate relationship is spurious. They also show the relative size of the effect of multiple independent variables on dependent variable.

A researcher controls for alternative explanation in multivariate (more than two variables) analysis by introducing a third (sometimes fourth, or fifth) variable. For example, a bivariate table shows that young people show more favorable attitude towards women empowerment. But the relationship between age and attitude towards women empowerment may be spurious because men and women may have different attitudes. To test whether the relationship is actually due to gender, a researcher must control for gender; in other words, effects of gender are statistically removed. Once this is done, a researcher can see whether the bivariate relationship between age and attitude towards women empowerment remains.

A researcher controls for a third variable by seeing whether the bivariate relationship persists within categories of the control variable. For example, controls for gender, and the relationship between age and attitude persists. This means that both male and females show negative association between age and attitude toward women empowerment. In other words, the control variable has no effect. When this is so, the bivariate relationship is not spurious.

If the bivariate relationship weakens or disappears after the control variable is considered, it means that the age is not real factor that makes the difference in attitude towards women empowerment, rather it is the gender of the respondents.

Statistical control is a key idea in advanced statistical techniques. A measure of association like the correlation co-efficient only suggests a relationship. Until a researcher considers control variables, the bivariate relationship could be spurious. Researchers are cautious in interpreting bivariate relationships until they have considered control variables.

After they introduce control variables, researchers talk about the *net effect* of an independent variable – the effect of independent variable “net of,” or in spite of, the control variable. There are two ways to introduce control variables: trivariate percentage tables and multiple regression analysis.

Constructing Trivariate Tables

In order to meet all the conditions needed for causality, researchers want to “control for” or see whether an alternative explanation explains away a causal relationship. If an alternative explanation

explains a relationship, then bivariate relationship is spurious. Alternative explanations are operationalized as a third variable, which are called *control variables* because they control for alternative explanation.

One way to take such third variables into consideration and see whether they influence the bivariate relationship is to statistically introduce control variables using trivariate or three variable tables. Trivariate tables differ slightly from bivariate tables; they consist of multiple bivariate tables.

A trivariate table has a bivariate table of the independent and dependent variable for each category of the control variable. These new tables are called *partials*. The number of partials depends on the number of categories in control variable. Partial tables look like bivariate tables, but they use a subset of the cases. Only cases with a specific value on the control variable are in the partial. Thus, it is possible to break apart a bivariate table to form partials, or combine the partials to restore the initial bivariate table.

Trivariate tables have three limitations. First, they are difficult to interpret if a control variable has more than four categories. Second, control variables can be at any level of measurement, but interval or ratio control variables must be grouped (i.e. converted to an ordinal level), and how cases are grouped can affect the interpretation of effects. Finally, the total number of cases is a limiting factor because the cases are divided among cells in partials. The number of cells in the partials equals the number of cells in the bivariate relationship multiplied by the number of categories in the control variables. For example, if the control variable has three categories, and a bivariate table has 12 cells, the partials have $3 \times 12 = 36$ cells. An average of five cases per cell is recommended, so the researcher will need $5 \times 36 = 180$ cases at minimum.

Like a bivariate table construction, a trivariate table begins with a compound frequency distribution (CFD), but it is a three-way instead of two-way CFD. An example of a trivariate table with “gender” as control variable for the bivariate table is shown here:

Partial table for males								
Level of Attitude	Age (in years)						Total	
	Under 40		40—60		61+			
	F	%	F	%	F.	%	F.	%.
High	300	60	200	33	30	6	530	33
Medium	140	28	270	45	120	24	530	33
Low	60	12	130	22	350	70	540	34
Total	500	100	600	100	500	100	1600	100

Partial table for females								
Level of Attitude	Age (in years)						Total	
	Under 40		40—60		61+			
	F	%	F	%	F.	%	F.	%.
High	350	70	200	50	20	4	570	41
Medium	150	30	150	38	220	44	520	37
Low	-	-	50	12	260	52	310	22
Total	500	100	400	100	500	100	1400	100

The replication pattern is the easiest to understand. It is when the partials replicate or reproduce the same relationship that existed in the bivariate table before considering the control variable. It means that the control variable has no effect.

The specification pattern is the next easiest pattern. It occurs when one partial replicates the initial bivariate relationship but other partials do not. For example, we find a strong (negative) bivariate relationship between age of the respondents and attitude towards women empowerment. We control for gender and discover the relationship holds only for males (i.e. the strong negative relationship was in the partial for males, but not for females). This is specification because a researcher can specify the category of the control variable in which the initial relationship persists.

The interpretation pattern describes the situation in which the control variable intervenes between the original independent variable and the dependent variables.

The suppressor variable pattern occurs when the bivariate tables suggest independence but relationship appears in one or both of the partials. For example, the age of the respondents and their attitudes towards women empowerment are independent in a bivariate table. Once the control variable “gender” is introduced, the relationship between the two variables appears in the partial tables. The control variable is suppressor variable because it suppressed the true relationship; the true relationship appears in partials.

Multiple Regression Analysis

Multiple regression controls for many alternative explanations of variables simultaneously (it is rarely possible to use more than one control variable using percentage tables). Multiple regression is a technique whose calculation you may have learnt in the course on statistics.

Note:

In the preceding discussion, you have been exposed to the descriptive analysis of the data. Certainly, there are statistical tests which can be applied to test the hypothesis, which you may have learnt in your course on statistics.

Lesson 32

SPSS Introduction, Data Entry and Descriptive Statistics
33-36 supposed to be developed new

Lesson No. 37

WRITING A RESEARCH PROPOSAL

The Research Proposal:

A research *proposal* is a document that presents a plan for a project to reviewers for evaluation. It can be a supervised project submitted to instructors as part of an educational degree (e.g. a Master’s thesis or a Ph.D. dissertation) or it can be a research project proposed to a funding agency. Its purpose is to convince reviewers that the researcher is capable of successfully conducting the proposed research project. Reviewers have more confidence that a planned project will be successfully completed if the proposal is well written and organized, and carefully planned.

The proposal is just like a research report, but it is written before the research project begins. A proposal describes the research problem and its importance, and gives a detailed account of the methods that will be used and why they are appropriate.

A proposal for quantitative research has most of the parts of a research report: a title, an abstract, a problem statement, a literature review, a method or design section, and a bibliography. It lacks results, discussion, and conclusions section. The proposal has a plan for data collection and analysis. It frequently includes a schedule of the steps to be undertaken and an estimate of the time required for each step.

For funded projects the researchers need to show a track record of past success in the proposal, especially if they are going to be in charge of the project. Proposals usually include curriculum vitae, letters of support from other researchers, and record of past research.

Research proposal is a document

- Prepared to present a plan for a research project to reviewers for evaluation.
- Can be a supervised research project or a project proposed to funding agency.
- Convince the reviewers about the capability of the researcher.
- For funded projects the researchers need to show the track record of past success.

Proposal development

- Research proposal to be developed in accordance with the expectations of the advisor, advisory committee, and funding agency as the case may be.
- Model guideline may be point of departure for discussion.

Proposal's Overt Functions

- Persuade a committee of scholars that the project shines with three kinds of merit:
 - Conceptual innovation;
 - Methodological rigor; and
 - Rich, substantive content.

Grab the attention

- Say what you have to say immediately, crisply, and forcefully.
- The opening paragraph, or the first page at the most, is your chance to grab the attention of the reviewer.
- Overstate, rather than understate, your point or question.
- Questions that are clearly posed are excellent way to begin. Was the decline in environmental pollution the result of corporate social responsibility? Or make a hypothesis.

Questions like

- Why is there an increase in cases related to sexual harassment at place of work?
- What is the effect of temporary assistance to the needy families on the children of recipients?
- How do the leaders use their emotional intelligence at their place of work?
- What is the level of prevalence of emotional labor in the job performance of airline staff?
- Is there a relationship between CSR and OCB?
- What are the emotional consequences of divorce on job performance?

Capture reviewer's attention

- Proposal reader looks for answers to three questions:
 1. What are we going to learn as a result of the proposed project that we do not know now?
 2. Why is it worth knowing?
 3. How will we know that the conclusions are valid?

Include a title on your proposal

- Don't leave the title for the end.
- A good proposal has a good title. First thing to help the reader begin to understand the nature of work.
- Use it wisely. Work on your title early and revisit it often.

A good title means:

- Having the most important words appear toward the beginning of the title
- Limiting the use of ambiguous or confusing words.
- Breaking your title up into a title and subtitle when you have too many words. [12 words recommended]
- Include key words that will help researchers in the future to find your work.

Describing the research problem

- Begin with a clear and simple formulation of the research question:

- *This research project tries to find out the extent to which vigilantism is growing within different sectors of the Lahore population. In particular the research focuses on the factors which promote and maintain vigilantism in Pakistani society.*
- Where does this question come from?
- Clarify the concepts.

Problem definition

- From broad to specific concern.
- Present problem statement in clear and precise manner. Problem could be:
- An existing business problem identified by the Manager.
- Scope for future improvement.
- Areas needing conceptual clarity.
- Curiosity of the researcher.

Specify the objectives

- Summarize the introduction into specific objectives, preferably number each objective.
- On completion of study, make sure that the stipulated objectives have been achieved.

Importance of the study

- Rationale for the study.
- Basic research.
- Applied research.

Make sure that your proposal has a comprehensive review of literature

- Never say that your area is so new that no research exists.
- Demonstrate that you are aware of the breadth and diversity of relevant literature.
- Show awareness of the important theories, models, studies, and methodologies.
- Time to get informed and to learn from others.

Conceptual/theoretical framework

- Debate in quantitative and qualitative research.
- Review of literature should help.
- Establish the context. Situate the problem in terms of its relevance to live theoretical currents.
- Demonstrate awareness of alternative view points.
- Use a fresh approach. Surprises and puzzles can persuade the reviewer.

Research design

- Discipline specific. Written in future tense. Two important requirements:
- 1. Must specify the research operations + how the results will be interpreted.
- 2. RD is not just a list of research tasks but an argument → why these tasks add up to the best attack on the problem.
- Any innovative parts of RD.
- Specify the archives, the sources, the respondents, and the proposed techniques of analysis.
- Ethical issues.

Sponsored Researches

- Symptoms of issues identified – tip of the iceberg – underlying factors to be identified.
- Management dilemmas to be translated into research questions.
- Terms of reference.
- Some steps may not get emphasis.
- Management's research decisions based on the urgency of the study, time available, existing information, and cost-benefit equation.

Research proposal sections

- Introduction: background, objectives, significance
- Review of Literature
- Theoretical Framework
- Hypothesis (es)/ research question(s)
- Research design (data collection technique, population, sample, tools, fieldwork, data processing and analysis)
- Report writing
- Time schedule
- Research Team
- Budget

THESIS WRITING

Every thesis is custom-made, yet some conventions of format

- Many universities have in-house, suggested formats or writing guides that researchers should be aware of.

Make an original contribution to knowledge

- The distinguishing mark of research at your level is *an original contribution to knowledge*.
- The thesis is a formal document whose sole purpose is to prove that you have made an original contribution to knowledge.
- Failure to prove that you have made such a contribution generally leads to failure.
- Therefore:

Thesis must show two important things:

- 1. you have identified a worthwhile problem or question which has not been previously answered, and
- 2. you have solved the problem or answered the question.
- Your contribution to knowledge generally lies in your solution or answer.

Make a clear statement of the question

- A very *clear* statement of the question is essential. 
- To prove the originality and value of your contribution, you must present a *thorough* review of the existing literature on the subject, and on closely related subjects.
- Then, by making *direct* reference to your literature review, you must *demonstrate* that your question
- (a) has not been previously answered, and
- (b) is worth answering.
- Describing how you answered the question becomes easier.

A Generic Thesis Format:

- The general plan of organization for the parts.
- Tailoring the format to the research will help:
- To obtain the proper level of formality, and
- To decrease the complexity of the report.
- Formally a thesis/dissertation submitted to the university.
- Usually bound with a permanent cover.
- Consultants write long report for the organizations.

Nearly all theses/dissertations begin with four elements

- A title
- An abstract
- A table of contents
- Introduction
- These are all routine matters.
- The impression created at the start of thesis/dissertation is very important.
- Therefore the writing of first few pages should never be regarded as a triviality. Some suggestions:

The Title

- Give a short title of your research. Subject to change. Have an effective title (keep notes for possible changes).
- Titles should catch the readers' attention; also informing them about the main focus of study.
- Can also be a two part title. Breaking the title up into a title and subtitle when you have too many words A snappy main title and then a subtitle. *Policing the lying patient: Surveillance and self-regulation on consultations with adolescent diabetics*

The Title (cont.)

- Have the most important words appear toward the beginning of the title.
- No use of ambiguous or confusing words,
- Include key words that will help researchers in the future to find your work.
- Follow a marketing approach.
- Should be short, catchy, meaningful. Do not use >15 words.

The Table of Contents

- Not a trivial matter. A scrappy or uninformative table of contents will create terrible impression.
- To achieve 2 ends:

- 1. To demonstrate that you are a logical thinker, able to write a thesis/dissertation with a transparently clear organization.
- 2. To allow your readers to see this at once, to find their way easily between different parts of the thesis/dissertation and to pin point matters in which they have most interest.
- Use of double numbering system. ??

Table of Contents

Chapter	Title	Page
I	Introduction	1
	Background	1
	Objectives	6
	Significance	9
II	Review of Literature	10
III	Theoretical Framework	18

When do you prepare the table of contents?

- It is outline of the structure of the thesis.
- Headings of chapters may remain the same. Subheadings likely to change as you proceed.
- Finalized towards the end especially with respect to pagination.

List of Tables

Number	Title	Page
1	Demographic Characteristics	35

1: Introduction

- Introduction is to answer the question: What is this thesis about? i.e.
- Why have you chosen this topic?
- Why this topic interests you?
- The kind of research approach or academic discipline you will utilize.
- State your research questions or problems.
- Role is to orient your readers. Do it clearly and succinctly. Do not over stretch. Also do not encroach upon other chapters (methodology).
- It is *not* just a description of the contents of each chapter.
- Chapter 1 to be last chapter, not in the literal sense. It should be rewritten and finalized at the end.

2: The Literature Review

- What should literature review contain:
- What do you already know about the topic?
- What do you have to say critically about what is already known?
- Has anyone else ever done anything exactly the same?
- Has anyone else done anything that is related?

2: The Literature Review (cont.)

- Where does your work fit in with what has gone before?
- Why is your research worth doing in the light of what has already been done?
- It displays your scholarly skills and credentials.
- You organize this section by *idea*, and not by author or by publication.

Do you need a literature review chapter?

- Know the relevant literature but just don't lump (dump) it into a chapter that remains unconnected to the rest of the study.
- Draw upon the literature selectively and appropriately as needed in telling the story of your research.
- So bring in appropriate literature as you need it, not in a separate chapter but in the course of your data analysis and/or any other discussion. Such a decision may be too radical.
- Write a conventional literature review chapter. Also cite literature in order to connect your narrow research topic to the directly relevant concerns of the broader research community.

Theoretical Framework

- Theory helps in understanding, explaining and prediction of the phenomenon.
- TF presents the theory which explains why the problem under study exists.
- Portrayal of how a particular theory provides explanation to the problem. Provides the structure that holds or supports the logic of research work
- This theory serves as a basis or foundation for conducting research on the issue.
- Need a strong foundation

Hypothesis and operationalization

- Hypothesis (es) or research questions.
- Show how the hypothesis (es) has (have) been drawn from the theoretical framework.
- Operationalization of the variables

Research Design

- Technical procedures must be explained.
- Supplement the material in this section with more details in the appendix. This part should address six topics:
- 1. *Purpose of study* → exploratory, descriptive, or explanatory. Why specific research design suited to the study?
- 2. *Data collection methods*. Primary or secondary data used. How primary data were collected – survey, experiment, observation. Multiple techniques used – triangulation.
- 3. *Sample design*: What was the target pop? Probability or non probability sample. Sampling frame. Type of sample. Selection process.
- 4. *Instrument of data collection*: What instrument and why? Put a copy in appendix.
- 5. *Fieldwork/Data collection*: how many, type of field workers used? Training/supervision. How was quality control assured?
- 6. *Analysis strategy*: How was the analysis carried – score index applied, statistics used.

Limitations:

- No report is perfect, so indicate its limitations. For example problems with:
- Sampling procedures.
- Non response.
- Avoid over emphasizing the weaknesses.

5. Research Design (cont.)

- Questions for a qualitative methods
- How did you go about your research?
- What overall strategy did you adopt and why?
- What design and techniques did you use?
- Why these and not others?

RD for Qualitative methods (Cont.)

To answer these questions describe the following:

- The data you have collected.
- How you obtained that data (e.g. issues of access and consent)
- What claims you are making about the data (representativeness of some pop./single case)
- The methods you have used to gather the data
- Why have you chosen these methods?
- How have you analyzed the data?
- The advantages and limitations of using your methods of data analysis.

RD for Qualitative methods (Cont.)

- Spell out your theoretical assumptions.
- Explain how you can generalize from your analysis. [combining qualitative with quantitative, purposive sampling guided by time and resources, theoretical sampling]
- Avoid over-defensiveness. Also self-confidence should not mean lack of self-criticism. Document the rationale for your research design and data analysis. Ask colleagues' critique.

Spencer et. al. gave the following guideline:

- Give an honest account of the conduct of the research.
- Provide full descriptions of what was actually done in regard to choosing your case (s) to study, choosing your method (s), collecting and analyzing data.
- Explain and justify each of your decisions.
- Discuss the strengths and weaknesses of what you did.
- Be open about what helped you and held you back.

Analysis of the data

- Present the findings in line with the objectives.
- Organize as a continuous narrative, designed to be convincing.
- Summary table and charts should be used
- Tables and charts may serve as points of reference to the data being discussed and free the prose from an excess figures.
- Detailed charts may be reserved for appendix.

Summary, Conclusions, and Recommendations

- Summary
- The Summary of contributions will be much sought and carefully read by the examiners.
- List the contributions of new knowledge that your thesis makes.
- The thesis itself must substantiate any claims made here. There is often some overlap with the Conclusions, but that's okay.
- Concise numbered paragraphs are again the best.

- Organize from *most* to *least* important.

Conclusions

- Conclusions are based on results.
- Conclusions are *not* a rambling summary of the thesis: they are *short, concise* statements of the inferences that you have made because of your work.
- Do not restate the research findings. Don't waste time of the reader. You got the results. So what?
- Organize conclusions as short numbered paragraphs, ordered from most to least important.
- All conclusions should be directly related to the research question.

Recommendations

- The biggest problem with this section is that the suggestions are often ones that could have been made prior to you conducting your research.
- Suggestions should emanate from experiences of conducting the research and the findings that have evolved.
- Make sure that your suggestions for further research serve to link your project with other projects in the future and provide a further opportunity for the reader to better understand what you have done.

References

- Note the Distinction
- A bibliography is the listing of the works that are relevant to the topic of research interest arranged in alphabetical order of the last names of authors.
- A reference list is a subset of the bibliography, which includes details of all the citations used in the literature survey and elsewhere in the report, arranged again, in the alphabetical order of the last names of authors.

Goals of referencing

- Crediting the author (s).

Enabling the reader to find the works cited

Give reference by following a style

Different modes are followed

- APA, ASA, or any other.

Appendix:

- Appendix presents the “too ...” material.
- Any material that is too technical or too detailed should be in appendix. Material of interest only to some readers. Subsidiary materials.
- Any material which impedes the smooth development of presentation, but which is important to justify the results of a thesis.

Some tips

Review two or three well organized and presented dissertations

- Examine their use of headings, overall style, typeface and organization.
- Use them as a model for the preparation of your own thesis/dissertation.
- In this way you will have an idea at the beginning of your writing what your finished thesis/dissertation will look like.
- A most helpful perspective!

Don't have to proceed writing chapters sequentially

- The major myth in writing a thesis/dissertation is that you start writing at Chapter One and then proceed sequentially. This is seldom the case.
- The most productive approach in writing the thesis/dissertation is to begin writing those parts of the thesis/dissertation that you are most comfortable with.
- Go with what interests you, start your writing there, and then keep building!

Always keep the reader's backgrounds in mind.

- Who is your audience? How much can you reasonably expect them to know about the subject before picking up your thesis?
- Usually your audience is pretty knowledgeable about the general problem, but they haven't been intimately involved with the details over the last couple of years like you have:
- Spell difficult new concepts out clearly.

Don't make the readers work too hard!

- The harder the examiners have to work to ferret out your problem, your defense of the problem, your answer to the problem, your conclusions and contributions, the worse mood they will be in, and the more likely that your thesis will need major revisions.
- Spell things out carefully, highlight important parts by appropriate titles etc.
- There's a huge amount of information in a thesis: make sure you direct the readers to the answers to the important questions.

Clear and unambiguous use of key concepts

- Prepare a list of key words that are important to your research and then your writing should use this set of key words throughout.
- There is nothing so frustrating to a reader as a manuscript that keeps using alternate words to mean the same thing.
- If you've decided that a key phrase for your research is "educational workshop", then do not try substituting other phrases like "in-service program", "learning workshop", "educational institute", or "educational program."

Table/figure presentation – a simple rule

- If you are presenting information in the form of a table or figure (graph, chart) make sure:
- You introduce the table or figure in your text.
- Insert the table/figure
- Following the insertion of the table/figure, make sure you discuss it.
- If there is nothing to discuss then you may want to question even inserting it.

Use the Table of Contents to help improve manuscript

- Use it to see:
- if you've left something out,
- if you are presenting your sections in the most logical order, or
- if you need to make your wording a bit more clear.
- See if the Table of Contents is clear and will make good sense to the reader. You will be amazed at how
- It is easy to see areas that may need some more attention.
- Don't wait until the end to do your Table of Contents.

Avoid

- Avoid using phrases like "Clearly, this is the case..." or "Obviously, it follows that ..."; these imply that, if the readers don't understand, then they must be stupid.
- Readers might not have understood because you explained it poorly.
- Avoid *red flags*, claims (like "Corporate social responsibility is the most important part of a management system"). Has to be demonstrated by evidence.

