

ESSENTIALS OF
S O C I A L
R E S E A R C H

Salahuddin M. Aminuzzaman



OSDER
PUBLICATIONS

Essentials of Social Research

Salahuddin M. Aminuzzaman

Copyright © 2011 by Muntareen Aminuzzaman

First Publication: 2011

Special Publication:2016

ISBN 978-984-33-2347-7

All rights reserved. No part of this book may be reproduced, copied, distributed or transmitted in any form or by any means or stored in a database or retrieval system , without prior written permission of the Author or the publisher or in accordance with prevailing copyright, design and patent laws.

Cover, Design and Illustrations by Mohammad Lutfullah

Computer Makeup

Md. Shamsul Hoque

Published by Osder Publications, 24/2 Eskaton Garden, Dhaka 1000, Bangladesh , www.osderpublications.com and printed by Osder Printers, 131 DIT Extension Road, Dhaka 1000.

Printed in Bangladesh

Price : Local Tk. 400.00, Foreign US\$ 30

Dedicated
To My Parents

Contents

<i>Preface</i>	IX
Chapter 1: Introduction to Research	13
Research: Meaning and Characteristics	14
Approaches to Knowledge	17
Philosophy of Sciences and Knowledge	18
Rationalism	18
Empiricism	19
Positivism and Constructionism	19
Research, Theory and Knowledge	22
Interrelation of Theory and Research	23
Basic Concepts of Social Research	26
Concept	26
Inductive and Deductive Reasoning	26
Validity	29
Variable	32
Operational Definition	34
Indicators	34
Model	34
Chapter 2: Social Research: Meaning and Approaches	39
Meaning of Social Research	39
Utility of Social Research	40
Limitations of Social Research	42
Objectivity in Social Research	43
Qualities of a Researcher	45
Ethics of Social Research	47
Dissemination of Research Findings	49
Typology of Social Research	50
Purposes of Social Research	57
Time Dimension in Research	57
Approaches of Research	58
Chapter 3: Research Methods	63
Method versus Methodology	63
Selection of Research Method	64
Selected Methods in Social Research	65
Content Analysis	65
Descriptive Method	69
Survey Method	70
Historical Method	72
The Case Study	74
Discourse Analysis	77
Focused Synthesis	78
Focus Group Discussion	79
Scenario Building	81
Use of Library in Social Research	82

Steps in Library Research	85
Research Review of Literature	86
Purposes of Review of Literature	86
Steps in Review of Literature	87
Chapter 4: Research Design	90
Meaning of Research Design	90
Research Question	94
Hypothesis	95
Operational Definition of Variable	97
Model Building	98
Theoretical Framework	101
Typical Format of a Research Proposal	101
Chapter 5: Steps in Social Research	105
Identification and Formulation of the Research problem	105
Formulation of Research Problem	106
Formulation of Hypotheses and Statement of Assumptions	108
Choice of the Empirical Variables	109
Choice of Research Method	109
Collection of Data	109
Analysis and Interpretation	109
Drawing Conclusions and Recommendations	110
Reporting the Research Findings	110
Chapter 6: Sample Design	115
Assumptions of Sampling	116
Utility of Sampling	116
Sample Size	117
Types of Sampling	119
Random Sampling	119
Stratified Sampling	120
Systematic Sampling	122
Cluster Sampling	123
Purposive Sampling	123
Quota Sampling	124
Multi-stage Sampling	124
Snowball Sampling	124
Convenience Sampling	125
Self-selected Sampling	125
Extreme Case Sampling	125
Choice of Sampling Techniques	125
Chapter 7: Mode of Data Collection	129
Survey of Documents	129
Interview	131
Observation	133
Questionnaire	135
Schedule	139

Data Collection through Agents	140
Other Methods	141
Projective Technique	141
Verbal Protocol	141
Problems of Data Collection	141
Quick Reference Sources	146
Selected Research Institutions in Bangladesh	147
Selected International/Regional Research Bodies	149
Other Sources	150
Chapter 8: Data Presentation and Analysis	153
Editing Data	154
Classification of Data	155
Measurement	156
Scales of Measurement	157
Selection of Appropriate Statistics	158
Data Analysis and Interpretation	160
Steps in Data Analysis	163
Data Preparation	163
Data Analysis	165
Interpretation and Drawing Inferences	172
Construction of Tables	174
Types of Table	177
Problems in Data Interpretation	181
Triangulation and Integration of Qualitative and Quantitative Methods	181
Chapter 9: Reporting Research	187
Steps in Report Writing	188
General Format of a Research Report	195
Other Formats	200
Chapter 10: Computer and Social Science Research	203
What is a Computer?	203
Hardware and Software	204
Some Popular Software Packages	209
Word Processing Software	209
Statistics Software	211
Spreadsheets	212
Database Management	213
Statistical Packages for Social Science (SPSS)	215
Selected Software for Qualitative Data Analysis	215
Internet Search	217
Internet Search Techniques	218
<i>General References</i>	221
<i>Annex I: Sample Questionnaire</i>	229
<i>Index</i>	239

List of Figures

<i>Figure 1.1 : The Research Process</i>	17
<i>Figure 1.2: Research and Theory Interrelationship</i>	23
<i>Figure 1.3 : Deductive and Inductive Approach to Theory Building</i>	27
<i>Figure 1.4 : Common Types of Validity</i>	29
<i>Figure 1.5 : Various Types of Variables</i>	32
<i>Figure 2.1 .Basic Qualities of a Researcher</i>	45
<i>Figure 2.2 : Attributes of a Researcher</i>	46
<i>Figure 2.3: Types of Social Research</i>	50
<i>Figure 2.4: Comparison between Basic and Applied Research</i>	51
<i>Figure 2.5: Purposes of Selected Types of Research</i>	57
<i>Figure 3.1: A Typical Catalogue Card</i>	83
<i>Figure 3.2: Comparative Classification System</i>	84
<i>Figure 4.1: Components of Research Design</i>	92
<i>Figure 4.2 : Example Models of a Hypothetical Problem: Model A</i>	100
<i>Figure 4.3 : Example Models of a Hypothetical Problem: Model B</i>	100
<i>Figure 5.1: Steps in Formulating Research Problem</i>	106
<i>Figure 5.2: Structure of a Research Report</i>	111
<i>Figure 6.1: Practice example – Sampling</i>	122
<i>Figure 8.1: Practice example – Classification</i>	155
<i>Figure 8.2: Practice example - Measuring Scales</i>	158
<i>Figure 8.3: Components of a Table</i>	179
<i>Figure 9. / Stages in Report Writing</i>	189
<i>Figure 10.1: Purposes of Various Types of Software</i>	216

List of Tables

<i>Table 1 : Income of Rural Household of Village Niamatnagar</i>	177
<i>Table 2: Distribution of Employees in Nischintapur Cooperatives</i>	178
<i>Table 3: Post High Schools Educational Aspirations of SSC Students by Sex</i>	180
<i>Table 4: Percentage Distribution of Students' Aspiration</i>	180
<i>Table 5: Access formal Health Delivery System in Selected Poverty Pocket Villages in Char lands in Bangladesh</i>	183

Preface

Across the course curriculum of social sciences, liberal arts and humanities both at the graduate and undergraduate level studies, Research Methodology has become a core subject. As a systematic study, research methodology deals primarily with the approaches and techniques as how to undertake a research without being biased or prejudiced. It offers a cluster of tactical approaches and logical skills to observe, record, interpret and infer on matters under study.

The practical necessity of writing this book has come out from my experience for last three decades of teaching research methodology at the graduate and undergraduate levels. This book is primarily targeted for those who have no previous training or formal experience in social research. The book therefore, deals with elementary aspects of social research in the pursuit of exploring social and development issues. The structure and contents of the book is designed to help the readers to guide themselves step by step in carrying out a social research.

Chapters one and two of this book deal with basic concepts and other issues related to social research. Different research methods have been introduced in chapter three. Design and systematic steps have been discussed in chapters four and five respectively. Principles of sampling are covered in chapter six while chapter seven focuses on different modes of data collection in social research. Chapter eight discusses different approaches and processes of data analysis, interpretation and presentation. Report writing and related principles have been covered in chapter nine. Chapter ten attempts to introduce the readers to personal computers and discusses their various uses in social research.

I wish to record my thanks to several persons without whom this book would not have been published. First, I wish to acknowledge my sincere gratitude to my colleague Professor Aka Firowz Ahmad, Chair, Department of Public Administration, University of Dhaka for his insistence, inspiration and support to bring out this revised edition of the book. I am indeed grateful to Prof. Mobasser Monem, Department of Public Administration, University of Dhaka who did the most painstaking job of proofreading the draft of the book. I gratefully recall those memories with my students and research assistants with whom I shared the pain and pleasure of data collection from the primary and secondary sources. I particularly want to express my sincere thanks to my research assistants who worked with me

about two decades back in the village of *Khagan* where for the first time, we learnt together the art and science of social research.

I would like to record my sincere gratitude and indebtedness to those scholars and researchers on research methodology whose works have been used in this book as references. Special thanks are due to Mr. M. Shahjahan Kazi who designed the cover of the book. Thanks are also due to Osder publications and its staff members for their support and cooperation in processing the content of the book. I am grateful to Mr. Mohammad Lutfullah for his kind assistance in formatting, cover and internal design of the book.

Finally, I acknowledge the inspiration from my daughter Sarah and the support rendered by my wife Muntareen, in editing the book.

April 2015

Salahuddin M. Aminuzzaman
Department of Public Administration
University of Dhaka
Bangladesh

CHAPTER **1** **Introduction
to Research**

CHAPTER 1

Introduction to Research

Social research is all around us. Academics, public officials, business executives and other professionals regularly use social research and its findings. People use social research to address policy issues like health, childcare, crime prevention. Food security, improve public health or even just to understand one's life. Reports of research are covered by electronic and print media, in popular magazines, in newspapers, and on the Internet. Research findings can indeed affect people's daily lives and public policies.

People conduct social research to learn something new about the social world; or to carefully document guesses, hunches, or beliefs about it; or to refine their understanding of how the social world works. A researcher combines theories or ideas with facts in a careful, systematic way and uses creativity. He or she learns to organize and plan carefully and to select the appropriate technique to address a specific kind of question. A researcher must also treat the people in a study in ethical and moral ways. In addition, a researcher must fully and clearly communicate the results of a study to others.

Social research is a process in which people combine a set of principles, outlooks, and ideas (i.e., methodology) with a collection of specific practices, techniques, and strategies (i.e., a method of inquiry) to produce knowledge. It is an exciting process of discovery, but it requires persistence, personal integrity, tolerance for ambiguity, interaction with others, and pride in doing quality work.

Social research is a process in which people combine a set of principles, outlooks, and ideas (i.e., methodology) with a collection of specific practices, techniques, and strategies (i.e., a method of inquiry) to produce knowledge.

Human being by nature is curious and inquisitive. From time immemorial, mankind has always challenged unexplained, uncertain and unknown matters. They deliberately attempted to explore the unknown world around them, questioned unexplained workings and peculiar, incidences.

In doing so, men have used different methods or approaches to form ideas

and develop apparent understanding of events, experiences and incidents that took place around his immediate and distant surroundings. In their process of investigation human being used various indigenous methods of investigation. In their strive for exploring the unknown world men have used all available means and analytical skills, both scientific as well as unscientific methods and or different indigenous modes of quarry or sources of knowledge like mythology, supernatural explanation, customs, taboos, tradition, rituals, syllogistic reasoning as analytical basis to examine, interpret, analyze and predict situations for getting a desirable and convincing answers to their problems and questions.

However, with the advancement of natural and social sciences, human being became more organized and systematic in their process of seeking explanation and answers to unknown queries. Gradual formation and advancement of scientific aptitude, logical arguments and reasoning, concept of ethics and the overall impetus of the discipline of the liberal arts, gave birth to a new process called 'research' to seek the answers of unknown questions in a systematic manner.

One might simply ask what do we mean by research. From a layman perspective the general impression of the word "research" portrays a serious laboratory condition of activities where very delicate actions and reactions are observed and experimented. However this picture of research efforts seems to be one side of the coin. The term research could have a very simple and down to earth meaning. The general meaning of research could be traced from its functional usage. Research is nothing but a systematic and objective attempt-to -study problem for the purpose of deriving general principles. The investigation is guided by consciously and scientifically collected data and information with an aim to add to the body of knowledge of a particular subject. Thus, any conscious attempt to study a problem systematically or any effort that aims to generate new knowledge may be regarded as research. Research in social sciences for that matter, is a rigorous scientific activity aimed at developing new bodies of knowledge applicable to the broad field of social studies.

As an investigative effort, research, in fact, attempts to discover answers to questions through the use of scientific methods. The incitement for research many come from different stimulants. Use of research output has at least three broad dimensions: a research problem may arise from a desire to know for the sake of knowing only; it may come from a desire to gain knowledge for useful purpose; or it may be a futuristic intervention to make a breakthrough in the world of unknown for future use and intercession. In its applied and popular usages, social science research is

intensely being concerned both with the development of general knowledge and with its application to current problems and issues.

Research : Meaning and Characteristics

Fundamental concern of research is to discover the truth. Research also attempts to scrutinize and test the extent of the validity of the previously drawn conclusions and to explore new facts and draws generalizations in the light of the objective conditions.

A typical definition of research could be drawn from Webster International dictionary. It defines research as "a careful critical inquiry or examination in seeking facts or principles, diligent investigation in order to ascertain something."

This definition is too broad to provide us a general meaning of research. Uncomplicated meaning of research could be easily understood by dissecting the word itself. In fact the activities that go by the name of research involves mainly a "re + search" i.e. repeated search. In a broad and

“Research is a critic, and exhaustive investigation or experimentation having as its aim the revision of accepted conclusions in the light of newly discovered facts.”

general sense, any conscious and repeated search for certain purpose, can be termed as research.

In this light, we can review another definition of research (Leedy, 1989:12):

It appears from the above definition that research is also supposed to be concerned with re-searching the accepted conclusions, prove the facts of the empirical world to predict, accept or reject ideas, events etc., seek knowledge and 'truth' in the light of the explored facts.

Put more formally, research is a systematic, careful inquiry or examination to discover new information or relationships and or to expand or verify existing knowledge for some specific purposes. Precisely, we can identify the following aims of any research pursuits. Functionally, research attempts to :

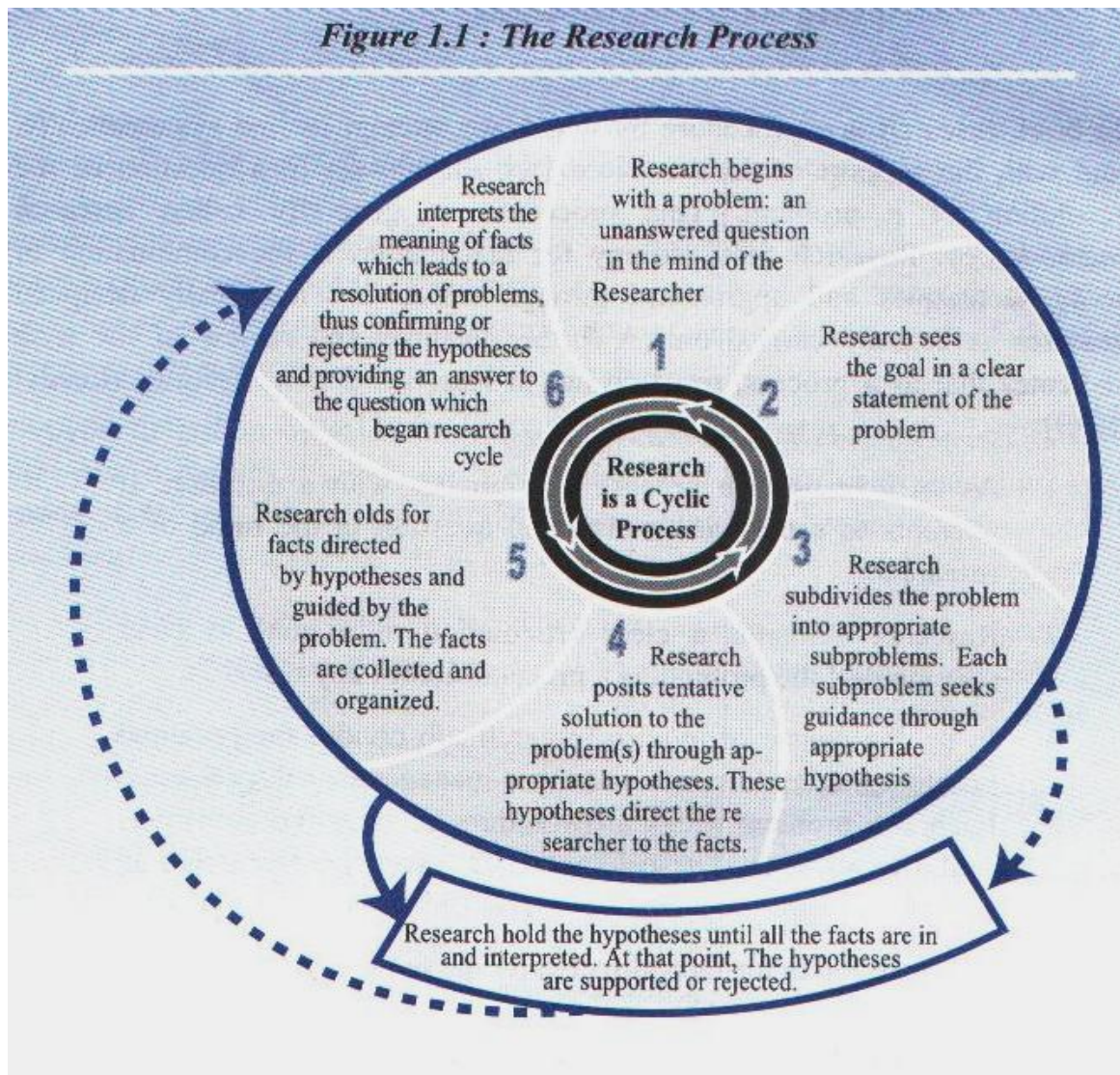
- a. find new dimensions and generalizations with old data;
- b. know old conclusions with new data;
- c. reach in one conclusion from the same set of data;

- d. put forward an entirely original idea or theory, or to discover unexplored horizon of knowledge;
- e. find or to resolve contradictions existing in the area of study.

In brief, research is a procedure by which we attempt to find systematically, mid with the support of demonstrable fact, the answer to a question or the resolution of a problem. This procedure is generally called *research methodology*. Research methodology for that matter, is the combination of tools, techniques and approaches through which a scientifically designed research is actually carried out. A further analysis and review of the term indicates that as a process, research has at least six distinct features (Leedy; 1989):

1. As an investigative process it originates with a question. It attempts to satisfy an unanswered question in the mind of a researcher.
2. Research demands a clear articulation of a goal. A clear statement of the problem is a precondition of any research.
3. In its due course of inquiry research sub-divides the principal problem into appropriate and more manageable sub-problems. Each sub-problem seeks answer through tentative constructs called hypothesis. These hypotheses "direct the researcher to collect and examine facts.
4. Research looks for facts directed by the hypothesis and guided by the problem. The facts are collected, organized and processed in a systematic methodological approach.
5. In its analysis, research endorses only solid, measurable data and information in attempting to resolve the problem that initiate the research.
6. Research, by its nature is a circulatory process. It interprets the meaning of the facts which leads to a resolution of the problem, thus confirming or rejecting the hypotheses and providing answer to the question which began the research cycle.

Research process is therefore cyclical. It begins with a quest for an answer of a hard question and ends with a broad generalization or answers to specific inquiry. Figure 1 (see next page) shows the cyclic process.



Approaches to Knowledge

Research is a scientific approach of generation, development and dissemination of knowledge. In effect, scientific approach of learning or knowledge formation is one of the five methods of knowing. First of which is method of tenacity. In this approach to knowledge, people generally accept something to be true simply because many people fervently say or believe it to be true. The more it is repeated, the more valid the truth becomes. Another source of idea and knowledge formation is so-called common sense - where things commonly believed are considered to be true. Testing of common sense ideas are very important from research point of view. Because many common sense notions do not always turn out to be correct. The third method of knowing is the method of authority. If well respected and authoritative sources say that something is so, then it must be so. Common people quite very often accept it unchallenged and tend to hold the view unless someone with even higher authority rejects it. The fourth

approach to knowledge is the method of intuition, or as it is sometimes known "a priori method". This is based on the notion that people will reach truth because their natural inclination will be to do so. It is based on the notion that intuitive propositions should agree with not necessarily with experience (Bennett; 1983). The scientific method is the fifth approach to knowledge. This method has a key characteristic which is possessed by none of the other four methods, namely, self-correction. Scientific method has built-in checks which are so conceived will used that they control and verify the researcher's work and conclusions.

Scientific approach is based on systematic doubt, and aims at discovering the actual facts and rational interconnection of facts. It wants to establish general propositions through weighing the evidence. It can be highly elastic and can be made applicable to all domain of human activity that seeks to discover truth. Encyclopedia of Britannica defines scientific method as "a collection of terms denoting various processes by the aid of which the sciences are built up. In a wide sense, any method of investigation by which scientific or other impartial and systematic knowledge is acquired is called a scientific method" (Vol. XX; 127). Any systematic research is therefore, nothing but a scientific method of knowledge gathering and generation.

Philosophy of Sciences and Knowledge

A general understanding of philosophy of sciences can be traced by having an overview of two pertinent concepts: *epistemology* and *methodology*. The

Key Philosophies

Rationalism

Empiricism

positivism

Constructionism

term epistemology comes from the Greek word *episteme*, their term for knowledge. In simple terms, epistemology is the philosophy of knowledge or of how we come to know. Methodology is also concerned with how we come to know, but is much more practical in nature. Methodology is focused on the specific ways - the methods - that we can use to try to understand our world better.

Rationalism

Rationalists believe that knowledge is essentially acquired by a priori processes or is innate, in the form of concepts not necessarily derived from experience. Such relevant theoretical processes are also known as intuition. The knowledge is considered as the concepts being developed by the structure of the human mind.

Empiricism

Empiricism is generally a theory of knowledge which emphasizes on the role of experience, especially experience based on perceptual observations by all or some of the five senses.

Positivism and Constructionism

It is common in discussions of social science methods to contrast positivist and constructionist approaches to social inquiry and research. Unfortunately these two terms, while commonly used, are a bit problematic. Both have their origins in philosophy of science but the discussions of philosophy of the social sciences have moved beyond this simple juxtaposition of these seemingly opposed views.

Let us distinguish two philosophical concepts: *ontology and epistemology*. Ontology is the theory of what exists. There are two basic distinctions in ontology. One argues that there is a real world, independent of our observation and interpretation of it. This is called *realism*. As oppose to that is *phenomenology*, which suggests that it is difficult and not meaningful to speak of ‘real’ world; it is human interpretations of it are all that matter.

Epistemology, in contrast, is the theory of what we can know. Here too we can think of two polar positions. At one pole is the belief that we can conduct objective, unbiased observations and through them come to understand the world accurately. At the other pole is the view that all observations of the world are our own social constructions rather than images of an objective, external world. Needless to say, the view that we

Positivism

In its broadest sense, positivism is a rejection of metaphysics¹. It is a position that holds that the goal of knowledge is simply to describe the phenomena that we experience. The purpose of science is therefore simply to stick to what we can observe and measure. Knowledge of anything beyond that is impossible.

can understand the world objectively aligns with the realist notion that there is a world independent of our observations of it, while the view that all we can know is our social constructions aligns well with the phenomenological approach to ontology.¹

Epistemology and methodology are intimately related: the former involves the *philosophy* of how we come to know the world and the latter involves the *practice*. When most people in our society think about science, they think about some professor or scientist in a white laboratory

¹. *Metaphysics is defined as the branch of philosophy that examines the true nature of reality, whether visible or invisible. Metaphysics includes the relationship between mind and matter, substance and attribute, and fact and value. Basically, metaphysics is the philosophical study of being and knowing. It is very closely related to spirituality, but it is not religion. <http://www.whatismetaphysics.com>*

coat working at a laboratory and mixing up chemicals and reagents. A lot of our stereotypes about science come from a period where science was dominated by a particular philosophy *positivism* that tended to support some of these views. However over the years science has moved into an era of *post-positivism* where many of those stereotypes of the scientist no longer hold up.

In a positivist view of the world, science is seen as the way to get at truth, to understand the world well enough so that we might predict and control it. The world and the universe are deterministic and are operated by laws of cause and effect that we could discern if we apply the unique approach of the scientific method. Science therefore is largely a mechanistic or mechanical affair. We use deductive reasoning to postulate theories that we can test. Based on the results of our studies, we may learn that our theory doesn't fit the facts well and so we need to revise our theory to better predict reality. The positivist believed in *empiricism* the idea that observation and measurement was the core of the scientific endeavor. The key approach to the scientific method is the experiment, the attempt to discern natural laws through direct manipulation and observation.

Positivism draws on ontological and epistemological realism. In most social science discussions, this term refers to the vies that there is an objective world independent of our observations and that science can lead us to an understanding of the world that is free of social, political and cultural influences.

This view is contrasted with constructionism, which, drawing on phenomenological or constructionist perspectives in ontology and epistemology, emphasizes the social construction of knowledge about the world. In this view, the best approach to understanding the world is to examine how people see and define it.

It is very common to view positivism and constructionism as opposite and antagonistic approaches to the social sciences. But by decoupling the ideas of ontology and epistemology, we can see that these extremes may not be the most fruitful way to think about the social sciences. In particular, one can be an ontological realist, believing that there is an external reality that exists independent of our perceptions of it, while embracing elements of a constructionist epistemology. That is, we can believe that there is a reality 'out there' but realize that our observations and interpretations are shaped by psychological biases and quirks, cultural lenses, power relations and a variety of other forces that comprise the social construction of reality. If we are ontological realists but embrace the insights of *constructionism* we have to be very cautious, reflective and self-critical about how we do research,

which is exactly what we are doing when we think about and improve our research methods.

In real life situation pure induction and pure deduction are not always meaningfully possible. None of the method singularly can be considered as a valid tool to explain a process or phenomena absolutely. It is now well acknowledged that for social investigation deductive (analytical) approach must be supplemented by inductive (empirical) approach. Scholars have therefore combined the inductive and deductive methods of reasoning into one and named as *Logical positivism*.

However, there has been shift in understanding science since the middle part of the 20th century. One of the most important shifts has been a swing from *positivism* into *post-positivism*. Post-positivism is not just a slight adjustment to or revision of the positivist position - rather it is a wholesale rejection of the central tenets of positivism. A post-positivist begins by arguing and recognizing that the way scientists think and work and the way we think in our everyday life are not distinctly different. Scientific reasoning and common sense reasoning are therefore essentially the same process. There is no difference in kind between the two, only a difference in degree. Scientists, for example, follow specific procedures to

assure that observations are verifiable, accurate and consistent. In everyday reasoning, we tend to proceed so carefully, when the stakes are... the post-positivist high, we become much more cautious about critical realist believes measurement.

... the post-positivist critical realist believes that *the goal of science is to hold steadfastly to the goal of getting it right about reality, even though we can never achieve that goal...*

One of the most common forms of post-positivism is a philosophy called *critical realism*. A critical realist believes that there is a reality independent of our thinking about that science can study. Positivists were also realists' The difference is that the Post-positivist critical realist recognizes that all observation is rambled and has error and that all theory is revisable. In other words, the critical realist

is *critical* of our ability to know reality with certainty. Where the positivist believed that the goal of science was to uncover the truth, the post-positivist critical realist believes that *the goal of science is to hold steadfastly to the goal of getting it right about reality, even though we can never achieve that goal*. Because all measurement is fallible, the post-positivist emphasizes the importance of multiple measures and observations, each of which may

possess different types of error, and the need to use *triangulation* across these multiple errorful sources to try to get a better bead on what's happening in reality. The post-positivist also believes that all observations are theory-laden and that scientists mid everyone else, for that matter, are inherently biased by their cultural experiences, world views, and so on. Post-positivism rejects the relativist idea of the incommensurability of different perspectives, the idea that we can never understand each other because we come from different experiences and cultures. Most postpositivists are constructivists who believe that we each construct our view of the world based on our perceptions of it. Because perception and observation is fallible, our constructions must be imperfect. Positivists believed that objectivity is a characteristic that resided in the individual scientist. Scientists are responsible for putting aside their biases and beliefs and seeing the world BS it 'really' is. Postpositivists reject the idea that any individual can see the world perfectly as it really is. We are all biased and all of our observations lire affected by our mind set. Our best hope for achieving objectivity is to triangulate across multiple fallible perspectives. Thus, objectivity is not the characteristic of an individual; it is inherently a social phenomenon. We never achieve objectivity perfectly, but we can approach it. The best way for us to improve the objectivity of what we do is to do it within the context of a broader contentious community of truth-seekers who cross check and criticize each other's work.

Research, Theory and Knowledge

The following section presents a brief discussion on how research is related with theory building and generation of alternative framework of analysis.

Before we focus on the relationship between research and theory let us explain what do we mean by theory.

It is very difficult to nail down the term "theory", partly because the concept has very different meaning to different disciplines and even at different moments in a particular discipline. In its most simple sense any conjecture or deduction drawn from general experience is called theory. Theory is a logical framework which attempts to organize and explain a variety of specific facts. Theory could also be viewed as well established assumptions and an approach for making systematic deduction.

Theory in its simplest sense is a set of principles, abstracts that is used to explain, analyze and predict any phenomena, process and occurrence. Theory for that matter is an analytical framework to explain "if and then" conditions.

A theory is essentially an explanation of the relationship and underlying principles that appear to characterize the particular phenomena under study. Intention of a theory in modern science is to summarize

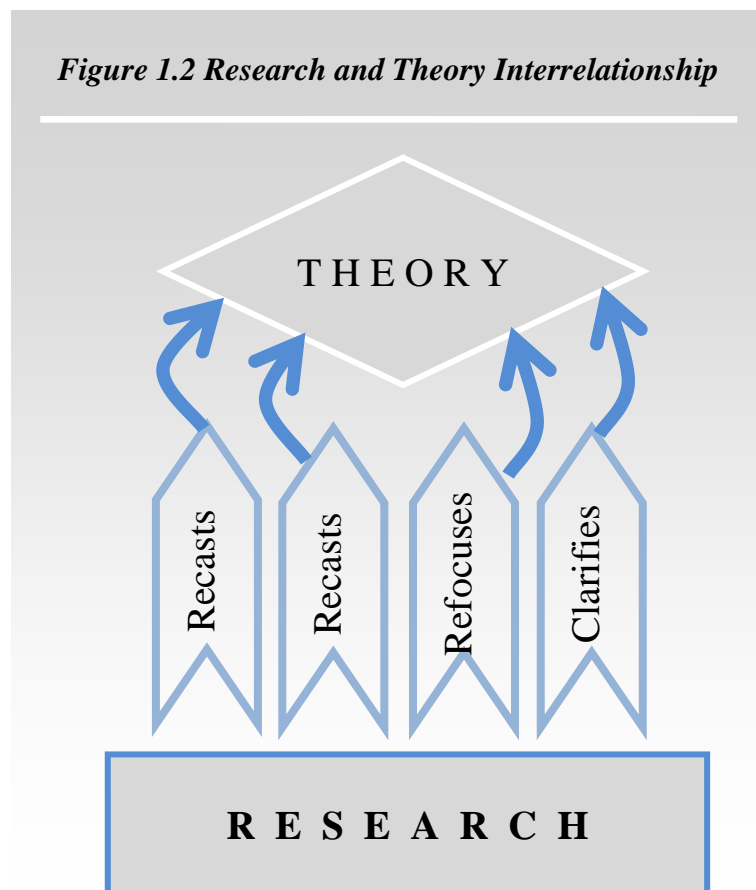
existing knowledge to provide an explanation for observed events and relationship and to predict the occurrence of as yet unobserved events and relationships on the basis of the explanatory principles embodied in the theory.

More specifically, theory explains the relationships, causality and dependency of certain variables. It also predicts the possible direction or momentum of those variables under study. Theory helps us to draw predictive, causative and conclusive judgments towards a broad generalization.

In earlier times, a theory was normally considered as the final explanation of an event, however, in today's reality, a theory is no more considered as given, rather it is reserved with some tentativeness, no matter how greatly the accumulation of findings are consistent with it. It is considered as the most probable or most efficient way of accounting for those findings in the light of present knowledge, but it is always open to revisions. It is not a static or a final formulation.

Interrelation of Theory and Research

Theory and research are intertwined. The relation of theory and



research is based on a kind of mutual support and contributions. Theory indicates the precise areas in which further research is likely to be useful, provides; summary of the findings of a number of related studies, and thereby presents a basis for explanation and prediction. Research findings, on the other hand, can test theories which have been worked out, clarify theoretical concepts, and also suggest new theoretical formulations or extend the existing ones. Research efforts which

are stimulated by theoretical considerations may raise new theoretical issues, which in turn lead to further research, and develop an indefinite

cyclic process. A social scientist may get involved at any point of this spiral of activities. The social researcher adds his insights and contributes to the process by linking the results of his studies Inwards the formulation of new theories and conceptual constructs. To conduct without theoretical interpretation or to theorize without research is to Ignore the essential function of theory as a tool for achieving economy of thought (Beveridge; 1950).

One man function of empirical research is therefore to test or verify the generalization and assumptions of the existing theories. In fact empirical research goes far beyond the passive role of verifying and testing theories. It does more than confirming or refuting hypotheses. Research performs four major functions (Labovitt, Hadedorn; 1976). Research as process: (a) initiates theory; (b) helps recasting theory; (c) refocuses theory; and (d) helps in clarifying theory.

Research Initiates theory

Scientific research in most cases leads to findings that usually put forward the basis for the formulation of a new theory. Findings of a newly designed research can refute the established generalizations and existing theories. This in other words, creates a vacuum and encourages the scholars, theoreticians to explore, examine and establish a new set of theory or theories.

Research helps recasting theory

Theories are no more considered as constant. With the constant efforts and inquisitive spirit of the researchers newer facts are being generated every day. Different assumptions and conditions, upon which theories are based, are constantly being either challenged and or changed. Research, therefore, attempts to refurbish existing theories.

Theories in social science are usually based on empirical findings, logical deductions. Theories therefore explain, interpret and predict processes and phenomena in a logical and consistent manner. However, in many cases, for existing theory, commonly applied to a subject matter does not adequately take into account the deviant cases or the non-conforming results i.e., the ones that are not in accordance with the predictions made by the hypotheses derived from the theory. In such cases research presses for its reformulation.

Research refocuses theory

Results or the findings of an empirical research often stimulate the researchers to refocus or sharpen an existing theory. Empirical research may also refocus theory by shifting the interest of researchers to new areas of interpretation or by identifying different exogenous and or endogenous

variables that constitute the problematic. Empirical researchers therefore set the general trends in the development of theory. Moreover, the changes in and or introduction of alternative research methods could also bring alternative explanation that ultimately redefine and highlight the existing theoretical construct and areas of knowledge.

Research clarifies theory

Theories are generally abstract and predict the casual relationship between the variables- both explanatory and dependent. Research findings provide data and information to clarify the already existed theories. In addition, the concepts embodied in the theories are also operationally defined to draw a generalization. Operational definition of a concept is the basic requirement of an empirical research. Thus, in doing an empirical research, a researcher provides an easy and understandable theoretical framework which explains theories and the logical relationships of the key variables.

The Grounded Theory

The Grounded Theory (GT) refers to theory that is developed inductively from a body of data. Grounded theory takes a case rather than variable perspective. It begins with a research situation where the researcher attempts to understand what is happening in a particular process and how the players or actors manage their roles. This is mostly done by thorough observation, conversation and interview. After each spell of data collection and diagnostic interviewing, the researcher takes note on the key observations and issues (Glaser, 1998). GT is a general research method for behavioral science developed by the sociologists. GT is a systematic generation of theory from data that contains both inductive and deductive thinking. GT essentially attempts to develop a platform of understanding on the basis of ground reality and popular perceptions of the subject being studied. One goal of a GT is to formulate hypotheses based on conceptual ideas that are prevalent among the observing units or a set of respondents. In GT, hypotheses are generated by constantly comparing conceptualized data on different levels of abstraction, and these comparisons contain deductive steps. The basic goal of GT is to discover the participants' main concern and how they continually try to understand and formulate ideas or matter of concern. The questions the researcher keep on asking in GT are "What's going on?" and "What is the main problem of the participants and how are they trying to solve it? These questions are answered by the core variable and its sub cores and properties in due course. GT does not aim for the "truth" but to conceptualize what's going on by using empirical data. GT is therefore one of the strongest tool of analysis for descriptive and

exploratory research. GT therefore attempts to illustrate and operationalize the concepts from empirical perspectives.

Grounded Theory is based on a concept-indicator model, which directs the conceptual coding of a set of empirical indicators derived from data. The basic idea of the grounded theory approach is to read and re-read a textual database like field notes and "discover" or label variables (called categories, concepts and properties) and their interrelationships. Grounded theory assumes that uncial life is not random. It exists as sets of behavioral uniformities, which Occur and recur over time.

Basic Concepts of Social Research

Concept

In any research effort one of the basic tools for analysis is the concept. A concept is a word or a phrase that symbolizes the phenomena under study and helps the researchers to communicate the experimented and observed findings. For example marginal utility, demand elasticity, multiplier, accountability etc. Concept is based on the critical study of reality. Concepts are used to construct a framework to guide the research process and investigation approach. It also helps in organizing the properties of the objects under investigation. Concepts are therefore, important framework which is used to relate, integrate and explain different phenomena in order to draw generalized impressions.

Concepts are grouped into two broad categories (Gopal;1963: III), concepts by postulation; and concepts by intuition. The former have their meanings designated by the postulates of some deductively postulated theory in which they occur. They have no other meaning apart from the specific theory, and therefore, when used in relation to two different theories, they have two different meanings. A concept by intuition denotes something which is immediately apprehended. Its meaning is abstracted from wider and empirical context, and as such the meaning is constant.

Inductive and Deductive Reasoning

Research as a scientific approach for exploring and examining any process or phenomena is based on logical arguments and reasoning. In research we seek facts from which to draw conclusions. Drawing conclusions depends on the researcher's ability to reason logically. Research as scientific approach is based on two important methods of reasoning: *inductive and deductive*.

The Inductive Method: Inductive reasoning works from specific observations to broader generalizations and theories. Informally, we sometimes call this a "bottom up" approach (please note that it's "bottom up" and *not* "bottoms up" which is the kind of thing the bartender says to

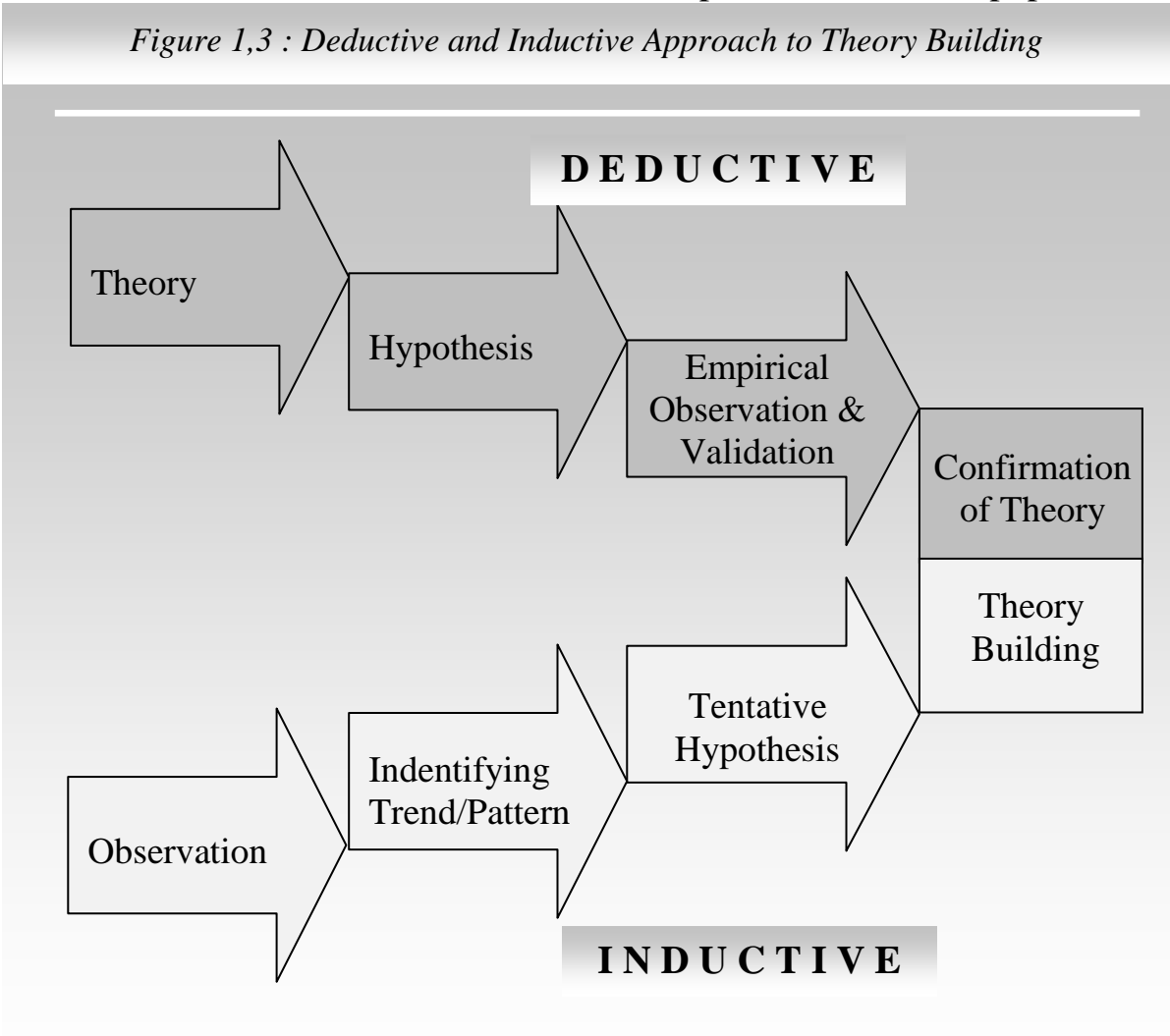
customers when he's trying to close for the night!). In inductive reasoning, we begin with specific observations and measures, begin to detect patterns and regularities, formulate some tentative hypotheses that we can explore, and finally end up developing some general conclusions or theories.

The inductive method consists of studying many individual situations in order to develop generalized conclusions. For example:

Kamal is mortal and observing a number of other mortals as well, the researcher might then note that all the observed mortals are men, therefore arriving at the tentative conclusion that all men are mortal.

Inductive reasoning is a process whereby generalizations are drawn from particular facts. In induction reasoning one starts from observed data and objects observed. Induction reasoning therefore rests on two processes - observation and generalization. This procedure is followed in most research projects, when new facts are being studied, new truths are revealed and new general propositions or theories are put forward. Four conditions are necessary for inductive reasoning:

- a. observations must be correctly performed and accurately recorded;
- b. observations must cover cases that are representative of the population



from which they are drawn;

- c. observations must cover a sufficient number of cases; and
- d. conclusions must be confined only to the statements that are substantiated by findings and are not over-generalized or too inclusive.

The deductive method: Deductive reasoning works from the more general to the more specific. Sometimes this is informally called a "top-down" approach. We might begin with thinking up a *theory* about our topic of interest. We then narrow that down into more specific *hypotheses* that we can test. We narrow down even further when we collect *observations* to address the hypotheses. This ultimately leads us to be able to test the hypotheses with specific data- a (or not) of our original theories.

The *deductive method* of reasoning starts from a general principle or rule generally regarded as fact, and assesses a specific fact or case that seems to fit the rule or principle. This involves reasoning from the universal or general to particular. In other words, the generalizations are drawn on the basis of certain inptions which are either self-evident or based on concrete observations. The main function of deductive reasoning is to clarify the nature of relationship between premises and conclusions in a logical framework. The classical illustration of deductive logic is:

All men are mortal; Kamal is a man; therefore Kamal is mortal.

A researcher might then follow up this deductive reasoning with an empirical test.

Two conditions, are, however, essential in this type of reasoning:

- a. the general principle or rule must be correct, i.e., true;
- b. it must also be applied only to those cases that properly come under its scope.

Inductive reasoning, by its very nature, is more open-ended and exploratory, especially at the beginning. Deductive reasoning is more narrow in nature and is concerned with testing or confirming hypotheses. Even though a particular study may look like it's purely deductive, most social research involves both inductive and deductive reasoning processes at some time in the project. In fiict, it doesn't take a rocket scientist to see that we could assemble the two graphs above into a single circular one that continually cycles from theories clown to observations and back up again to theories. Even in the most constrained experiment, the researchers may observe patterns in the data that lead them to develop new theories.

Validity

In any research, validity is the most important consideration. Validity is a descriptive term used as a measure that accurately reflects the concept that is intended to be measured. Validity is concerned with the soundness of data, and effectiveness of the measuring instruments. Validity raises questions like:

What does the research intend to measure? How well and how comprehensively, how accurately does it measure? There are several types of validity. *Validity* is an important term in research that refers to the conceptual and scientific soundness of a research study (Graziano & Raulin, 2004). The primary purpose of all forms of research is to produce valid conclusions. Furthermore, researchers are interested in explanations for the effects and interactions of variables as they occur across a wide variety of different settings. To truly understand these interactions requires special attention to the concept of validity, which emphasizes the need to eliminate or minimize the effects of extraneous influences, variables, and explanations that might detract from a study's ultimate findings. Validity is, therefore, a very important and useful concept in all forms of research methodology. Its primary purpose is to increase the accuracy and usefulness of findings by eliminating or controlling as many confounding variables as possible, which allows for greater confidence in the findings of a given study.

The most common types of validity are briefly discussed below:

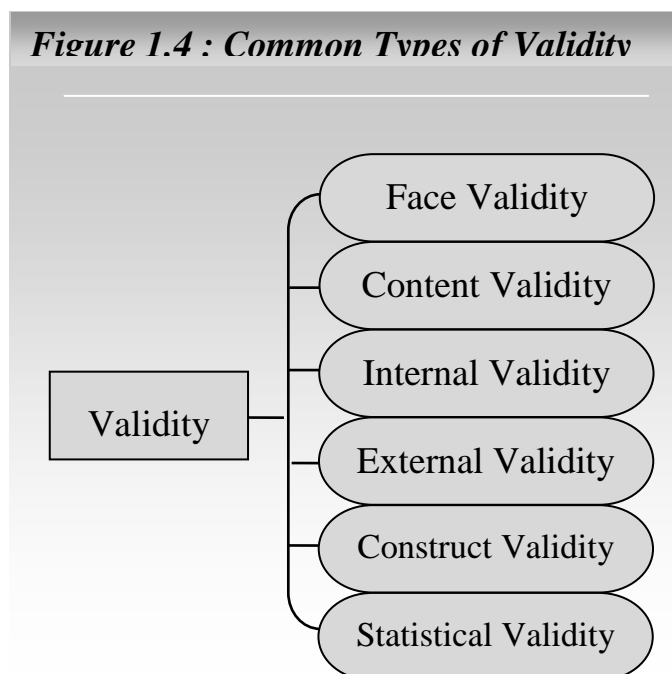
Face Validity

Face validity is the quality of an indicator that makes it seem a reasonable measure of some variables. This type of validity relies basically upon the

subjective judgment of the researcher. It asks two questions: i. Is the instrument measuring what it is supposed to measure? ii. Is the sample adequate to be representative of the behavior or trait being measured?

Content Validity

Internal validity is the accuracy with which an instrument measures the factors or situations under study i.e., the content being studied.



Internal validity

Internal validity refers to rule out the ability of a research design to or make implausible alternative explanations of the results, or plausible rival hypothesis² and demonstrate that the independent variable was directly responsible for the effect on the dependent variable and, ultimately, for the results found in the study. Internal validity has to do with the accuracy of the results. Results could be inaccurate if samples are not selected randomly. Internal validity is the freedom from bias in forming conclusions in view of the data. It seeks to ascertain that the changes in the dependent variable are the results of the influence of the independent variable rather than the manner in which the research was designed. A research has internal validity when it accurately identifies the causal relationships of the variables. Internal validity attempts to rule out the rival explanations to demonstrate that the conclusions drawn are valid. In summary, internal validity denotes that the independent variables really does affect the dependent variable.

External Validity

External Validity is concerned with the generalizability of the results of a research study. In all forms of research design, the results and conclusions of the study are limited to the participants and conditions as defined by the contours of the study. *External validity* refers to the degree to which research results generalize to other conditions, participants, times and places (Graziano & Raulin, 2004). External validity is related to conclusions that can be drawn about the strength of the inferred causal relationship between the independent and dependent variables to circumstances beyond those experimentally studied.

External validity is the validity of generalized (causal) inferences in scientific studies, usually based on experiments as experimental validity. External validity has to do with the generalizability of the findings to the population. If the sample selected is only urban population under the age of 25, then it would be hard to generalize the results to the entire population of the country. Inferences about cause-effect relationships based on a specific scientific study are said to possess external validity if they may be generalized from the unique settings, procedures and participants to other populations and conditions. The most common loss of external validity comes from the fact that experiments using human participants often employ small samples obtained from a single geographic location or with

² A plausible rival hypothesis is an alternative interpretation of the researcher's hypothesis which is the interaction of the independent and dependent variables that provides a reasonable explanation of the findings other than the researcher's original hypothesis (Kosnow & Kosenthal, 211)2).

idiosyncratic features. Because of this, one cannot be sure that the conclusions drawn about cause-effect-relationships do actually apply to people in other geographic locations or without these features.

External validity is concerned with the extent to which the results of a research can be generalized beyond the specific conditions of the settings *in* which the study was undertaken. This type of validity is concerned with the generalization of the conclusions reached through observation of a sample to the universe; or more simply stated can the conclusions drawn from a sample be generalized to other cases?

Research has external validity when it shows something that is true beyond the *narrow* limits of the study. If the research findings are true not just for the particular time but are generally true for other people, time and space, then the research is externally valid.

Construct Validity

In the context of research design and methodology, the term *construct validity* relates to interpreting the basis of the causal relationship, and it refers to the congruence between the study's results and the theoretical underpinnings guiding the research (Kazdin, 2003c). The focus of construct validity is usually on the study's independent variable. In essence, construct validity asks the question of whether the theory supported by the findings provides the best available explanation of the results. In other words, is the reason for the relationship between the experimental intervention (independent variable) and the observed phenomenon (dependent variable) due to the underlying construct or explanation offered by the researchers (Campbell & Stanley, 1966; Cook & Campbell, 1979; Christensen, 1988; Graziano & Raulin, 2004; Kazdin, 2003c). There are two primary methods for improving the construct validity of a study. First, strong construct validity is based on clearly stated and accurate operational definitions of a study's variables. Second, the underlying theory of the study should have a strong conceptual basis and be based on well-validated constructs (Graziano & Raulin, 2004).

Statistical Validity

The final type of validity that we will discuss in this chapter is the critically important yet often-overlooked concept of statistical validity. As its name implies, *statistical validity* (also referred to as *statistical conclusion validity*) refers to aspects of quantitative evaluation that affect the accuracy of the conclusions drawn from the results of a study (Campbell & Stanley, 1966; Cook & Campbell, 1979). Statistical procedures are typically used to test the relationship between two or more variables and determine whether an observed statistical effect is due to chance or is a true reflection of a causal relationship (Rosnow & Rosenthal, 2002). At its simplest level, statistical

validity addresses the question of whether the statistical conclusions drawn from the results of a study are reasonable (Graziano & Raulin, 2004).

Variable

Variable is a general class or category of objects, events, or situations, e.g. sex, income, social class etc. Within this class, specific instances will vary. Webster's dictionary (1969) defines a variable as something which is "able or apt to vary, changeable." A variable is a measurable dimension of a concept, for example height or a measurable concept that takes two or more values, either for one unit to the next or for any unit at different period of time (Easrtman; 1984). A variable is a symbol which stands for any one of a set of two or more mutually exclusive values. All researches require the manipulation or measurement of variables. Variable is a quantity in which a researcher is interested and that varies in the course of the research or that has different values for different samples of observation in a. research. In other words, variables are qualities the researcher wants to study and draw conclusions about.

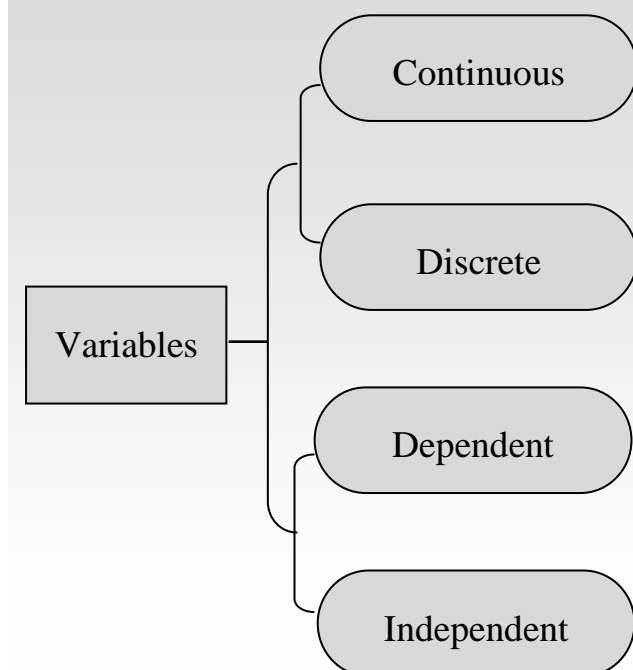
Variables, as the name suggest, must vary and have at least two values. In effect, explanation and analysis of the changes or differences in the variables is the core focus of a research work. Based on the research questions and the research objectives, a researcher chooses the variables. Success of a research would largely depend on how accurately the research variables have been identified. Poorly chosen variables may lead to useless explanations or results.

Variables may be classified in many. ways. One classification scheme dichotomizes variables as either continuous or discrete.

Continuous Variables

can take values within a specified interval of real numbers. Because any value in the interval can be taken, and because these values can differ by

Figure 1.5 : Various Types of Variables



infinitely small amounts, it is not possible to count all the values in, say the interval between 1 to 10.

Discrete Variables

Variables that can only take on a finite number of values are called *discrete variables*. A discrete variable is one that cannot take on all values within the limits of the variable. For example, responses to a five-point rating scale can only take on the values 1, 2, 3, 4, and 5. The variable cannot have the value 1.7. A variable such as a person's height can take on any value. Statistics computed from discrete variables have many more possible values than the discrete variables themselves. The mean on a five-point scale could be 3.117 even though 3.117 is not possible for an individual score. All qualitative variables are discrete. Some quantitative variables are discrete, such as performance rated as 1,2,3,4, or 5, or temperature rounded to the nearest degree. Sometimes, a variable that takes on enough discrete values can be considered to be continuous for practical purposes. One example is time to the nearest millisecond.

Another classification scheme divided variables into two categories: a. Independent; b. Dependent.

Dependent Variable

The variable that is assumed to depend on or be caused by other is called dependent variable. If we find that income is partly a function of the level of formal education, income is being treated as a dependent variable. The dependent variable is that quantity or aspect of nature whose change or different states the researcher wants to understand or explain or predict. If a researcher wants to investigate whether there is any relationship between smoking habit and the death rate of cancer patient, then smoking habit is an independent variable while death rate is a dependent variable.

Independent Variable

An independent variable is that whose values are not problematical in an analysis but are taken as simply given. Independent variables are those that do not depend on other variables. Independent variable is a variable whose effect upon the dependent variables the researcher attempts to understand and explain. In other words the independent variable is that variable which causes change in the dependent variable. This is also known as explanatory variables. For example, if we say that an increase in the price of bread causes fewer bread to be demanded then we are saying that the quantity of bread demanded depends on price. Quantity is therefore a dependent variable and price is an independent variable. One has to note that any given

variable might be treated as "independent" in one part of an analysis and "dependent" in another part of the analysis.

Operational Definition

A variable is an abstract concept that must be translated into concrete forms of measurable observation or manipulation. The process of translating concepts and variables into measures is generally termed operationalization of variables. Thus variables like "income", "job satisfaction", "amount of reward" etc. must be defined in terms of the specific method used to measure or manipulate it. Operational definition is therefore a connotation of the observed variable in terms of the operations or techniques the researcher uses in measuring or manipulating the variable. Variables are often quite vague and difficult to measure. Systematic study of variables are not possible unless the concepts involved in the variables are operationally defined. In order to study a variable empirically, an operational definition of the variable is a must. The task of operationally defining a variable forces the researcher to discuss abstract concept in concrete terms. For example, "job satisfaction" as a variable may be operationally defined by : amount of output produced, level of motivation at work, level of variety in work, scope of participation, peer group relationships, etc. Researchers must always translate the variables into specific operations for manipulating or measuring. However, one has to be clear at this point that an operational definition of a variable is not necessarily universal. Each researcher may have their own definition of the same variable from their own perspective and the guiding theoretical framework.

Indicators

Many variables in social science research are quite abstract and general. In order to give a precise understanding and operational meaning, the variables are measured by specific indicators. Indicators are the quantitative and qualitative expressions of the variables. An indicator is therefore, the unit of measurement of the variables. To permit a scientific research of an abstract and general variable, a clearly defined indicator or several indicators are selected that link it to observation. The choice of indicators largely depends on the availability and reliability of data and information, the possibility of obtaining certain kinds of information and data, and the broad theoretical and conceptual framework that guide the researcher.

Model

Model is an idealization, an abstract of some part of real world and is an incomplete representation of real thing - an imagination of reality (Quade; 1975:142). A model is central to every analysis. Imaginative scholars put

together some sets of abstract propositions for which one can deduce hypothesis. Such a set of proposition is usually called model. A model is a substitute for reality-representative that is, hopefully, adequate for a problem at hand. It is made up of factors relevant to a particular situation and to the relations among them. Model is apt to be ad-hoc, tentative, and future directed. A model is like a mini theory and has the same nature of a theory. It focuses on n few elements abstracted from all of reality (Simon; 1969). The terms model and theory are therefore used interchangeably.

In constructing a model for a given problem situation, actions taken are: i. to single out certain elements as being relevant to the problem under consideration; ii. to make explicit the significant relationships among these elements; and iii. to formulate hypotheses regarding the nature of these relationships.

Models can be classified broadly into two types: quantitative and qualitative. A *quantitative model* is a mathematical model defined by a precise set of assumptions expressible in terms of well defined set of mathematical relationships. These might be equations or other analytical expressions or instructions for a computer. The behavior of such a model is determined completely by the assumptions, and the conclusions are derived as logical consequences of those assumptions without recourse to judgment or intuition about the real world process or problem being modeled.

A *qualitative model* typically is based on less precise assumptions than arc required for a quantitative model and its behavior may be described by a combination of deductions from these assumptions and by further subjective judgment about the process or problem being modeled. Detail discussion on model has been made in chapter-4.

Mathematical functions

The word function simply means "is determined by." Equation (i) shows that Y is the function of X , i.e., y is determined by X . This merely says that Y is mathematically dependent upon. Given the value of X , one can find the value of Y ; that is there is a rule for obtaining the value of Y when we are given the value of X :

$$Y = f(X) \quad (i)$$

The statement $Y = f(X)$ does not mean Y equals f times X , the parentheses do not mean multiplication as they would mean in elementary algebra. Rather " f " represents the rule by which X is transformed into Y - it tells what must be done to the X to get the Y .

Functions are also be classified into two types: a. *explicit functions*; b. *implicit functions*.

The statement that $Y = f(X)$ is called explicit function; Y is an explicit function of X because there is a definite rule specifying how the value of Y is determined by the value chosen for X .

Again if we feel that the values of X and Y are connected or related in some special ways i.e., they are not independent of one another, we may write them in the implicit form as:

$$f(X, Y) = 0 \quad (\text{ii})$$

The implicit function states:

1. That there is a mutual relationship between the X and Y variable;
2. That each variable determines the other.

The explicit functions corresponding to this implicit function are called the inverses of each other.

To illustrate the concepts further let's take an example. Let Q^d be the quantity of bread demanded, p^p be the price of bread, P^w be the price of wheat, and N be the population. Then we may formulate the following equations:

$$Q^d = f(P^p, N) \quad (\text{iii})$$

Here we are saying that the quantity demanded is a function of the price and population, i.e., quantity depends on price and population. Here the functional notation accommodates more than one independent variable. The convention is to place the independent variables inside the bracket and separate them by commas. We can also write the following function:

$$P^p = f(P^w, \dots) \quad (\text{iv})$$

Here the price of bread is a function of (depends on) the price of wheat. Based on the above functions some guidelines for defining variables can be formulated (Simon; 1969):

1. Any variable on the left hand side of an equals sign is automatically dependent in that equation.
2. Any variable on the right-hand side of an equals sign is automatically independent in that equation.

CHAPTER **2** **Social Research
Meaning and
Approaches**

CHAPTER 2

Social Research: Meaning and Approaches

During the recent years at the age of growing social crisis and unrest, the role and responsibility of the social scientists have increased tremendously. Social scientists carry out very important functions in the social engineering process. As social engineers they propose new models, alternative approaches, methodological tools and techniques to encounter social issues and problems. They advocate new ideas, generate alternative thought and act as social 'critics'. In general, social researchers are responsible for developing new body of knowledge, theoretical constructs, and alternative paradigm to investigate, explain, understand, interpret and predict the social processes.

Meaning of Social Research

Social science research is broadly based on the assumption that an arguable and valid explanation of any phenomena can be drawn from the objective analysis of the observable events. An elaborate and scientifically designed social research therefore, provides an opportunity to the social science scholars and researchers to perform their diagnosis in responding to the composite social issues and problematic.

A social research entails scientific investigation conducted in the field of social sciences using theories, models, concepts, tools, techniques, processes drawn from the various disciplines of social and behavioral sciences to explain interpret, understand, and improve the social issues, problems and institutions.

P.V. Young (1975:30), a pioneering scholar of social research methodology, defines social research as:

The systematic method of discovering new facts or verifying old facts, their sequences, interrelationships, causal explanations and the natural laws which govern them.

Social research, as appears from the definition, involves the application of scientific method for understanding, studying and analyzing the social life in order to modify, correct or verify the existing knowledge as system.

Social research has its own characteristics; it focuses primarily on human behavior and social issues and problems. The main emphasis is to develop and generate new knowledge, facts, and to discover and establish interrelationship between processes and phenomena in a social setting. It also aims to establish causal and mutual and natural relationship between

various human behaviors and the natural laws. Social research in this manner is strictly governed by the logical and scientific methods. From functional point of view, social research has very many purposes of which followings are the main (Ghose;1982):

- i Social research aims at understanding the human behavior and its interaction into the social system and institutions. .
- ii. Social research helps the acquisition of new knowledge and theory to develop insights into the existing social problems.
- iii. Social research aims to understand social life and thereby to gain a greater measure of control over social behavior.
- iv, It helps to improve and test the various tools of analysis, or to test these against the complex human behavior and institutions.

Young (1975), however, broadly identified four main purposes of social research:

- i. Social research attempts to understand the cause-effect relationship of some social phenomena. Due to inadequate knowledge or obscure facts, causal connections may not be immediately known, necessitating social research.
- ii. Social research may be motivated by the desire to discover new theories, concepts and techniques in order to gain knowledge more efficiently and within a short time horizon. Recently, quantitative techniques are being applied to social research for more accurate and precise results.
- iii. Curiosity and necessity are the important factors of social research. Social research is a means by which unknown factors are explored to explain social phenomena.
- iv. The primary motive of social research is to understand, analyze, and explain social phenomena to appreciate social dynamics. It also attempts to develop an operational solution.

Utility of Social Research

Social research is a rigorous course of social investigation to explore and uncover yet unknown facts, logical premises and the dynamics of social institutions, processes, behavior and critical interactions. It helps us to develop and establish scientific standard and a sharp sense of judgment against superstitions, orthodox views and preconceived notions. Young (1969:36) further elaborates the practical utility of social research:

Social research is persistently opening our eyes to the social reality, simplifying the mysterious within the seemingly common place in social life

and shattering its garments of make-believe by which pious hands have hidden their uglier features. The obvious function of research is to add new knowledge to its existing store, but its power of cleansing our minds of clichés and removing the rubbish of inapplicable theory are equally notable. Scientific research... is also a rejective process; especially in social sciences... understanding can be (advanced) not only by gains in knowledge but also by discarding outworn assumptions.

In the light of the above discussion and considering the practical utility we can further discuss the usage of social research under following headings:

Analysis and Understanding of Social Issues

A systematically designed social research attempts to tap and recognize social issues and unsolved problems. It seeks to unfold the shortcomings and evils of social institutions. It also distinguishes the cause and explanatory variables and recommends or indicates about the possible interventions. It provides the guidelines for the reform or change strategies. Social research generates the firsthand information regarding social institutions, pattern of social interactions and network of power relationships and the overall social dynamics. Social research also generates the empirical base for further analysis and investigation of unsolved social issues.

Social Planning

Data and information is the essential prerequisites for the preparation of any plan. Any planning exercise therefore requires a reliable data base, factual knowledge on which a course of action could be developed and the difficulties in its implementation anticipated. Development plan therefore needs varied types of data and information and other empirical observations related to different socio-economic indicators. Social research findings for that matter, generate a comprehensive data and information base for planning exercises either in macro or micro level. Social research provides the detailed and comprehensive picture of the socio-economic conditions, levels of aspiration of the people at large.

Prediction

One of the major functions of social research is to establish causal relationships between and among the cause variables. Modern social researchers use both quantitative and qualitative methods to explore and examine such relationships in order to examine the present dynamics and also predict the future trend or movement of such relationships under changed and or manipulated conditions. On the basis of such predictions, better socio-economic planning and control can be ensured by the social research.

Advancement of Methods and Techniques

Social science" scholars in modern days are also known as social engineers. Through different action and operation research, the social science researchers are involved in designing and developing different models, tools and techniques, approaches and procedures geared to the need of the socio-economic management. Through different evaluation and policy analysis research social scientists suggest alternative action packages and methodological treatments.

Limitations of Social Research

Social research in general does not produce results as precise as of the natural sciences. Premises of social research are almost always uncertain. Lots of unpredictable conditions dictate the parameters of social research.

Several factors inhibit the applicability of the findings of social research. Chaplin argues that application of social science knowledge to the solution of social problems is hindered by the existing habits of thought and action. He identifies at least eight social obstacles to the acceptance of current knowledge or evidence in the field of social sciences (Chaplin; 1955:22):

- i. The subject matter of social science is emotion arousing.
- ii. The normative set and value-judgment approach tend to attach "praise" and "blame" to natural situations in human relationships.
- iii. The scientific social observer is himself a part of the social process he tries to observe.
- iv. The confidential and privileged character of much sociological information makes scientific or objective formulation of knowledge a difficult process.
- v. "Conspiracies of silence" involves conventions that often block social research of implementation of evidence.
- vi. There may be unpleasant consequence to the minority group when social science is applied.
- vii. Much of the subject matter of social science consists of verbal behavior, which frequently is intangible and trite.
- viii. Concentration and continuous mental effort is required to know that such concepts as intangibility, reactivity, and probability are basic to social understanding.

Objectivity in Social Research

Very often the validity of social research findings is questioned by the critical observers. If the research is not appropriately designed, there is every chance that the research may come up with illusory observations and premature conclusions and would lack external and internal validity.

The most important element of validity of social science research findings is the issue of objectivity. Objectivity can be defined as "the willingness and ability to examine evidence without any bias or prejudice" (Ghose; 1982:176). In any scientific investigation, objectivity is the first condition of research. As a matter of fact, objectivity is the function of partly the appropriate understanding of the truth and or reality. As against subjective value judgment and personal biases, objectivity, "involves the correct method of tackling the problem and the question of epistemology" (Ghose; 1982:177). One can identify a comprehensive list of factors that influence objectivity in social science investigation and research. Some of the selected influencing factors are :

- i. personal pride, prejudices and notions of the researcher;
- ii. professional and personal motives of the researcher;
- iii. customs, norms, values and superstitions;
- iv. simplicity or complexity of the subject-matter under study;
- v. personal self interest of the researcher;
- vi. qualitative nature of subject matter;
- vii. lack of uniformity and standard;
- viii. lack of theoretical framework, poor empirical base;
- ix. inappropriate methodological tools and techniques;
- x. moral values;
- xi. ethnocentrism;
- xii. external pressure.

In order to ensure objectivity in social research, we can opt for a variety of approaches and methods. The most common method is to fall back upon a simple measure, i.e. questioning the validity of the theoretical framework upon which the research is based. To what extent the framework stand on reason? Is the theoretical framework sound and logically consistent? If such critical questions are satisfactorily answered, the research Endeavor qualifies the first test of objectivity.

Researcher himself and the research methods and tools chosen for the research could constitute as the sources of possible biasness in a social research. The researchers may have their own likes and dislikes and personal biases. Following is a general inventory of the different types of biases that cost the objectivity and generalization of a research :

- a. professional and personal bias of the researcher;
- b. data collectors and informers may be biased;
- c. biasness due to sampling. Researchers tend to opt for convenient and unrepresentative sampling than rational design;
- d. biasness in the process and mode of data collection;
- e. a poorly designed questionnaire could also reflect the bias of the researcher;
- f. use of inappropriate statistical tools and faulty analysis could generate biasness;
- g. the orientation and philosophical approaches of the researcher could also cause biasness. Being either against or in favor of certain concepts and theory, the researchers could provoke conceptual biasness.

However, there are some safeguards against such biasness. Certain research techniques could be used to control and or eliminate such biases. These are:

- i. By the use of standardized terms, concepts and theories, the researchers can reduce to a great extent the conceptual biasness. This also minimizes personal bias and guides the research in drawing generalizations.
- ii. Quantitative methods could also be used as a safeguard against the possible intercession of biasness. Quantitative method of research is helpful to bring about some measures of objectivity. The statistical and mathematical methods as tools of analysis are free from subjective bias and in many cases have built-in self correcting tests.
- iii. Social research as a scientific investigation depends to a great extent on the empirical data base. The empirical method of inquiry based on data collected from the primary data, published reports, surveys and studies of the reliable institutions not only minimizes personal bias but also guarantees the objectivity of the research.
- iv. Use of systematic sample design also guarantees a higher degree of objectivity in social research.
- v. During recent years, through the introduction of different mechanical methods like computers, the chance of subjectivity particularly in data

processing and analysis, testing the validity of the findings and the overall interpretation of the result has been reduced considerably.

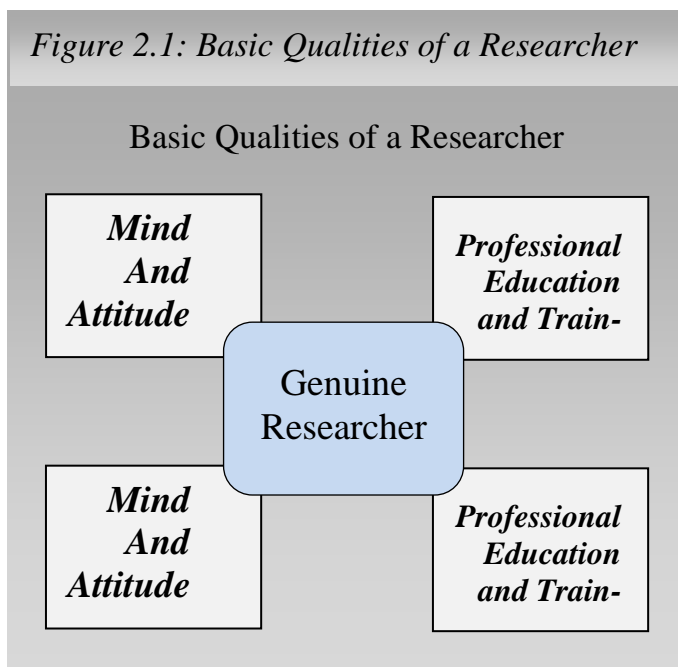
- vi. Initiation of group research could also reduce subjectivity. A topic of research, when investigated by a group of researchers either jointly or individually has a higher probability to be more objective than to be subjective.

Qualities of a Researcher

Whatever scientific method is applied to ensure objectivity in social research, it all depends on the attitude, temperament and the personality of the researcher himself.

Social research is not a layman's job. It needs systematic preparation and academic and professional training. A social researcher for that matter, is a specialist. He carries out the detail diagnostic analysis as well as specifies different prescriptive interventions in certain area of specialization. A researcher being a specialist, concentrates mostly on specialized matters

and, therefore, knows more and more about less and less. What are the general attributes and traits one should have in order to be a professionally sound researcher? It is indeed quite difficult to illustrate the basic qualities of a researcher. However following special traits should be considered as the basic personal qualities of a genuine researcher:



Mind and Attitude

A true researcher should have an open and creative mind to think and act scientifically. His attitude and perception and analysis of events should be regulated by scientific reasoning and strong logical foundation.

Creative Imagination

A researcher's mind must always intellectually be alert to comprehend various changes in the endogenous and exogenous environment. Accurate and timely observation, creative thinking and analytical perception are the fundamental qualities of a good researcher. In order to be more effective he

needs to have a high degree of imaginative power and be able to quickly understand and catch the problem by probing deep into the matter.

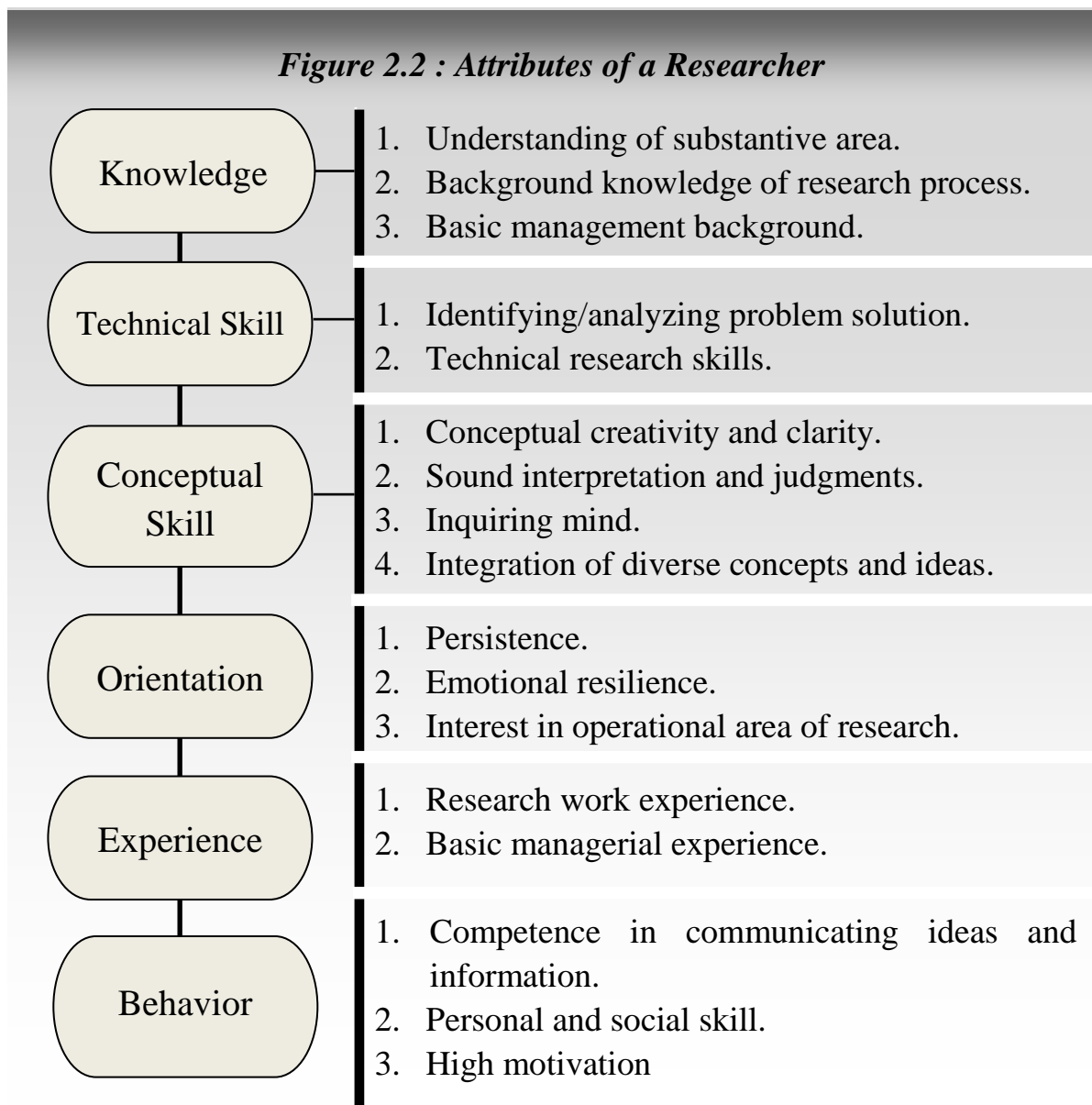
Professional Education and Training

A researcher must have meticulous understanding and thorough knowledge his area of research, The concepts, symbols and the implications of his project III nut only be clear to him, he should also have practical experiences and training to understand, analyze and tackle the problem.

Patience and Perseverance

Research is a tiresome continuous process. It is a' unique combination of success and failure. As an intellectual exercise, research requires perseverance, tenacity and patience on the part of the researcher.

The following figure presents a brief checklist of the main elements of a researcher's competency.



Ethics of Social Research

Every researcher has a commitment to contribute to the stream of knowledge and is equally obligated to protect the interest and welfare of their research subjects. In each step of research, certain ethical concerns guide the researcher. These ethical guidance could be generated from the kinds of questions studied by the researcher and the methods used to obtain the answers, the procedures used when the subjects were chosen, and the methods used in analyzing data etc.

There are at least two approaches that could be maintained to ensure ethical standards of research, a. Giving the participants a clear idea about the research; b. Preventing the misuse of research findings.

Giving the Participants clear idea

Every researcher should very honestly and clearly indicate the purpose, utility and the true nature of the research to the respondents and participants. In clarifying the true nature of the study the researcher should drive to achieve the following (Kidder; 1981: 404):

- i. Convey to the participants the investigator's sense of the potential value of the research.
- ii. Give the participants an appreciation of the contributions they have made to the research.
- iii. Provide the participants with an educational experience that includes an understanding of behavioral science research as used in the study in which they have taken part.
- iv. Develop in the participants an understanding of the necessity of employing questionable practices to obtain meaningful answers to the research questions asked in the study.
- v. Immunize the participants against the tendency for negative impression of self that are developed in the experiment to preservation even after attempts have been made to correct them.
- vi. Convince the participants of the investigator's regrets over the need to employ questionable practices and concern over the participants' feelings about having subjected to these practices.
- vii. Give the participants a perspective on their experiences that minimizes any feelings that they might have been manipulated; made fools of, shown to be gullible.

Preventing the abuse of Research Findings

Researchers from the very beginning of his research project should be critically aware of the possible misuse of his research findings. Misuse of research findings may arise from number of ways. There are at least three possible ways of misuse of research findings: *First*, data and findings may be misinterpreted either intentionally or unintentionally and hence could be used to support or promote wrong policy or decisions. *Second* is, that the result although interpreted correctly could be used for a purpose the researcher disapproves; and the third concern arises when application is evaluated differently by different people.

Some common examples of misuse or misinterpretation of research data and findings are as follows:

Misuse in explaining social issues

A social scientist, for example, is trying to understand the causes and possible remedies of low farm productivity. He accordingly gathered empirical data from the three selected sample units as cases. Based on his preliminary analysis the researcher argued that smaller the farm size higher the productivity. To the researcher dismay he could find that others have explained these findings other way around. They might conclude that since small firm size is the basis of higher productivity - there is no room for capital intensive farming. In contrast the researcher's own interpretation was that due to extremely low man-land ratio, a rural marginal farmer and the landless put all his efforts and maximize the production just for his mere survival.

Misuse for exploitation

Another possible misuse of research findings can be resulted from its application by the organization or institution in which the research was done. One such example could be drawn from industry. One of the well established findings in industrial research reveals that when workers participate in management and operational decision related to their jobs, their morale in such cases usually increases. Such high morale results in increase in productivity. This findings have had generated a great interest in participative management and new leadership styles. Based on this finding some social scientists argue that from participative management style, workers gain a new sense of self-direction and achievement motivation. On the other hand, some others see this same application as misleading and harmful to the workers. They feel that, employers support such research only to make workers happier and more resistant to Unionization, This, in

turn, makes it possible for the employers to continue their exploitation, if the higher productivity can be converted to higher profits rather to increased wages.

Faced with such concerns for misuse and misinterpretation of research findings, the reactions of social scientists however vary. Some take position that their responsibility ends with the effective conduct and objective interpretation of the results. Others show greater concern for the possible misuse of their research by anticipating probable misinterpretations and actively attempt to counter the misinterpretation through publication or public statement.

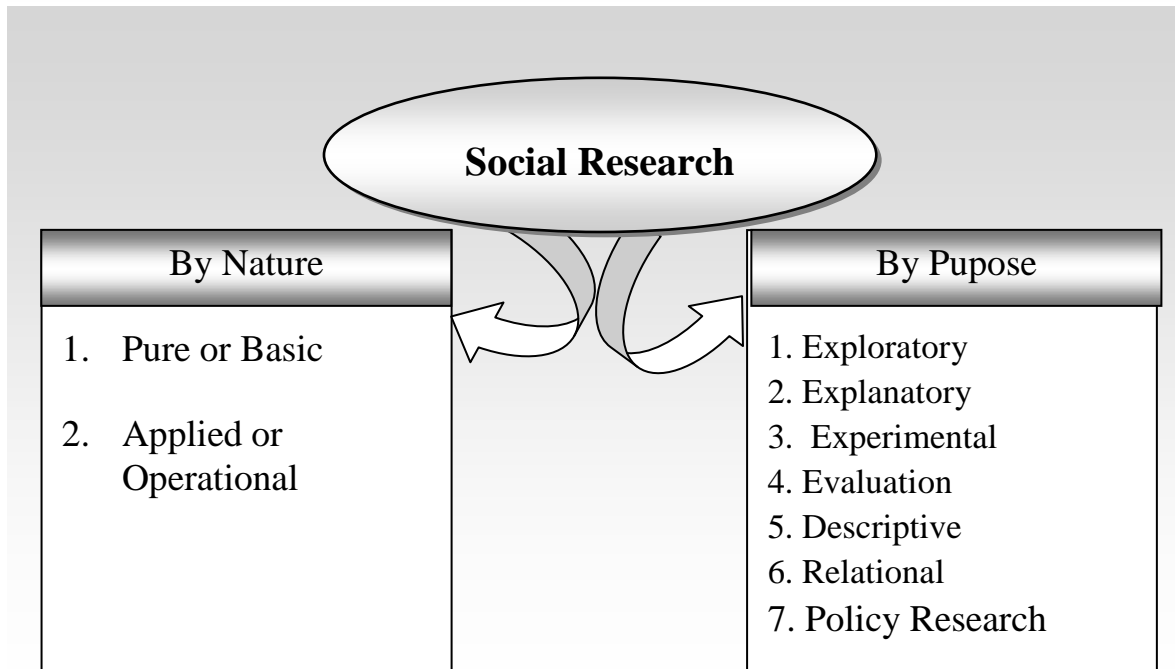
There are many ways the ethical concerns shape the form and approach of the research initiatives. One approach is *value-engaged* research in which the choice of the research problem is driven primarily by the needs of those whose interests the researcher hopes to support. One sophisticated view of this has been called '*the analytic deliberative process*' (Stern and Fineberg, 1996). In such a process, researchers regularly engage with the client or public to define the research questions, shape methodology and evaluate results. This helps to draw the insights and experiences of people 'on the ground,' while it also helps to 'get the right science' by making sure that the questions asked in research and the way they are answered make sense in terms of the experiences of the people who will be interested in and affected by the results of the research. An even more engaged position is *advocacy research* in which the researcher carries out studies specifically to lend support to a group they support and/or that is paying the researcher. Sometimes such research is carried out at the behest of social movements or communities. Sometimes it is in the form of expert testimony in support of one side of a dispute or another. Sometimes it takes the form of employment by a group advocating a particular position. In the political processes of most nations, those with political and economic power can easily hire scientific expertise as advocates for their positions, while those less powerful have far fewer scientific resources at their disposal. This can influence the way in which problems are defined and what views are considered legitimate and not legitimate in a policy debate.

Dissemination of Research Findings

It is indeed a moral responsibility of a researcher to disseminate the findings to the possible beneficiaries and interested quarters. In the process of dissemination of research findings, the social scientists normally confront with at least three different types of ethical issues. *First* is, whether a researcher has the responsibility for promoting such utilization; this is the counterpart of the issue of his or her responsibility for preventing the misuse

of the results. The *second* aspect is to do with the timing of the application of research findings -in particular, whether the application may be premature. The *third* has to do with rectifying what many regard as an undemocratic imbalance in the of research knowledge- i.e., the findings should reach to all possible beneficiaries irrespective of class or economic positions or background.

Figure 2.3: Types of Social Research



Typology of Social Research

Social research can be classified on the basis of their nature as well as on the basis of their *purpose*. Based on their nature social research can broadly be classified into two categories. These are (a) Fundamental or Pure or Basic research (b) Applied or Operational research.

Pure or Basic Research

This type of research primarily attempts to develop theoretical base and logical foundation of certain discipline or profession. Pure research attempts to raise [core or fundamental issues related to the principles and philosophical foundation of the subject matter. A scholar involved in pure research has no concern about any practical social use of his findings (Good:1959). In fact, pure research pursues knowledge for knowledge sake. Basic research is therefore an attempt to search-broad principles and integrates such principles without any immediate utilitarian objectives. It is also referred as "intellectual exercise" to generate substantive issues of a

profession or discipline. The motivation in basic research is understanding, discovering and underlying the universal laws, principles and theories without concern for immediate practical uses. In other words, pure or basic research arises from (he need It) develop a hnsii discipline. It is concerned with resolving, illuminating, or exemplifying :i theoretical issue. It aims to enhance knowledge and understanding of the world around us. Basic research therefore, is more of intellectual exploration arisinr from insatiable intellectual curiosity.

Applied Research

Applied research, as the name suggests, is carried out for practical purposes- to produce findings, identify interventions, that are applicable for functional and immediate use. Applied research, refers to investigation carried out for the acquisition of knowledge, application packages in order to control natural phenomena. It is concerned with generating new information to help serve current needs, solving problems or generate decision alternatives and intervention packages. As regards to the process and approach of investigation, there is, however, no distinction, between basic research and applied research. Even the problem to be investigated may be the same in basic research and applied research. Applied research is therefore aimed at solving specific practical problem within an organization, or in any process of action. Action research, policy research, feasibility study, operations research, evaluation research, cost benefit study, etc. are all examples of applied research.

Figure 2.4: Comparison between Basic and Applied Research

Basic	Applied
Research is intrinsically satisfying and judgments are by other researchers.	Research is part of a job and is judged by sponsors who are outside the discipline of sociology.
Research problems and subjects are selected with a great deal of freedom.	Research problems are "narrowly constrained" to the demands of employers or sponsors.
Research is judged by absolute norms of scientific rigor, and the highest standards of scholarship are sought.	The rigor and standards of scholarship depend on the uses of results. Research can be "quick and dirty" or may match high scientific standards.
The primary concern is with the internal logic and rigor of research design.	The primary concern is with the ability to generalize findings to areas of interest to sponsors.
The driving goal is to contribute to basic, theoretical knowledge.	The driving goal is to have practical payoffs or uses for results.
Success comes when results appear in a scholarly journal and have an impact on others in the scientific community.	Success comes when results are used by sponsors in decision making.

Source: Adapted from Freeman and Rossi (1984:572-573).

Exploratory Research

Exploratory or formulative research attempts to develop a general and common familiarity with a phenomenon and form new ideas and to achieve new insight into it. Social issues that draw the attention of the researcher are in many cases unique and there are not enough past studies or incidental references to form a research question. Quite frequently there is not enough information to begin with a specific hypothesis. In such cases exploratory research attempts to provide sufficient data for the formulation of further research hypothesis more precisely.

Usually this kind of study provides an opportunity to undertake further study to examine the entire structure of the problem under investigation.

For practical usage, the exploratory research is done for the following purposes: i. to simply satisfy the researchers' curiosity and desire for better understanding; ii. to get extensive information about a phenomenon, uncovering new dimensions and uncovering additional aspects of it; iii. to test the feasibility of undertaking a more careful study; and iv. to develop the methods to be employed in a more careful study.

Exploratory research supplies the needed knowledge and experience that will help in setting up fruitful hypotheses for subsequent, more detailed studies. It provides a basis for the selection of priorities for further investigation, and for the setting up of a hierarchy of needs or urgent areas of research to be undertaken in future.

The answers given in the exploratory research prove many insights as to the complexities of the different major orientations and suggested ways in which those complexities could be tapped in a more structured questionnaire to be administered to a much larger sample.

Explanatory Research

The social scientists try to establish the nature of the relationship between one or more phenomena or dependent variables, and one or more causes or independent variables. In fact most of the research undertaken by social scientists involves demonstrating the existence or non existence of such causal relationships between and among variables. Explanatory research aims to find out why things are as they are. The main purpose of this type of research is to examine the existing relationship of the variables and not necessarily to provide any predictive answer to an unsolved issue.

Explanatory research attempts to distinguish the major variables that are interlocked in a process. Using different statistical and quantitative techniques, explanatory research also identify the significant variables with their degree of influence and impact that characterize the process.

Explanatory research are also known as *Causal studies* which are designed to determine whether one or more variables (for example, a program or treatment variable) causes or affects one or more out come variables. If we performed a public opinion poll to try to determine whether a recent media campaign changed voter preferences, we would essentially be studying whether the campaign (cause) changed the proportion of voters who would vote Party X or Party Y (effect).

Experimental Research

Experimental research is specially required when the research purpose is to test a hypothesis or to document the expected results of introduction of a specific intervention. Experimental research records the changes in a dependent variable to corresponding manipulation and or changes in specific independent variables.

In experimental research, the researcher usually holds all variables constant except one. By varying this one and monitoring changes in the "output", the relationship between variables is carefully studied and documented. In essence, the researcher seeks to vary one of several independent variables (input), whilst measuring the effects on the dependent variables (output), keeping intervening variables constant.

Experimental research are broadly of two types : the laboratory experiments, where the problem to be studied is divorced from the facets of the real world surrounding it, but not connected with it; the field experiment, where attempts are made to study the problem in its real setting and to minimize the influences of seemingly unconnected facets or variables.

Relational Research

Relational research looks at the relationships between two or more variables. A public opinion poll that compares what proportion of males and females say they would vote for a Party X or Party Y candidate in the next general election is essentially studying the relationship between gender and voting preference.

Evaluation Research

This is a special form of applied research designed to evaluate program, projects or action packages. The main objective of evaluation research is to assess the consequences of activities undertaken to advance some valued goal, result of evaluation research are not meant merely to add to our store of knowledge or develop theory, rather it seeks to determine whether the activity ' progress being evaluated produced or is now producing the desired result; as II, it may seek to ascertain how, why and under what conditions these effects being produced. It also seeks to determine the production of undesired previously overlooked. Evaluation research is often sought by organizations, agencies looking for a sophisticated method of collecting information and constructing a model of "scientific neutrality" or impartiality to examine their performance. The evaluation research is carried out in organizations to critically examine the impact and consequence of their policy, program and project intervention. It is used as a scientific feedback mechanism for the formulation of future policies, projects and intervention packages.

Descriptive Research

Descriptive research is designed primarily to describe what is going on or what exists. Public opinion polls that seek only to describe the proportion of people who hold various opinions are primarily descriptive in nature.

Descriptive research is carried out to portray accurately the characteristics of groups, individuals, or situations, or to determine the incidence or frequency with which something happens. Depending on the status of previous knowledge, there may or may not be a specific hypothesis.

When a social scientist is faced with a research problem that has received little attention to date, the research process must at least initially be oriented towards obtaining more information and greater insight into the phenomena under study. The scientist's purpose will in this case be primarily descriptive.

Aside from seeking familiarity with the subject, descriptive research also aims to portray selected characteristics of the subject accurately - to study their stability distribution and occurrence. In doing descriptive research, then one might examine the uniformity or regularity, the rarity or universality of the phenomena which were of interest.

Descriptive studies provide necessary back ground for the formulation of more precise problem for subsequent and detailed study and for the development of hypothesis. Such investigations provide the means for obtaining initial ideas about the interrelationships among phenomena, and the types of determinants that might relevantly be measured.

Policy Research

Policy research is specifically directed at providing policy-makers with the options and information they need in order to solve the problems they face in their day to day and long run activities.

Policy research is defined as the process of conducting research on, or analysis of, a fundamental social problem in order to provide policymakers with pragmatic, action-oriented recommendations for alleviation of the problems. In other words, a policy research effort begins with a social problem, such as malnutrition, poverty or inflation, evolves through a research process whereby alternative policy actions for alleviating the problem are developed, and communicates these alternatives to the policy-makers.

Although there are several types of research processes like applied and basic research that may affect the efforts to alleviate social issues, policy research is unique in focusing action-oriented recommendations to fundamental problems (Majchrzak; 1984). Policy research aims to the study of policy making process. This type of research is typically performed by the policy planners, political scientists, and policy analysts. It attempts to analyze the processes by which policies are adopted as well as effects of those policies once adopted.

Policy research has both a high action-orientation and a concern for fundamental social problems. Policy research is similar to both basic research and policy analysis as it deals with fundamental social problems. Furthermore, policy research is similar to technical research because of its high action-orientation. Policy research in effect is the only type of research process that deals with both action-oriented and fundamental problems simultaneously.

Policy research may vary in number of different ways but there are some common characteristics that differentiate it from other research efforts. Following are the characteristics:

Policy research:

- is multidimensional in focus;
- uses an empirico-inductive research orientation;
- responds to study users; and
- explicitly incorporates values.

Policy research is multidimensional

Policy research typically attempts to resolve complex socio-political and economic problems that are composed of numerous dimensions, factors and causes. In its approach to study the problem, in its totality, the policy research must attempt to study the entire multidimensional nature of the problem.

Policy research uses an empirico-inductive orientation.

Policy research begins with the social problem and attempts empirically to induce concepts and causal theories as the study of social problem progresses. Referred as empirico-inductive, this approach contrasts sharply with the traditional scientific hypothesis testing approach. The hypothesis testing approach, in which phenomena are studied primarily in order to test specific theories, has little place in policy research. A policy researcher does not approach a social problem with predetermined theory of its cause and effects. Instead, the researcher engages in an interactive process whereby information and model building are constantly interchanged. This type of research has been termed by some scholars as the "grounded theory" approach to research (Strauss and Glaser; 1969).

Policy research is responsive to study users.

A critical characteristic of policy research is the identification of study users as one of the first steps in the policy research process. These users are numerous and vary in expectations, needs and values. Recognizing all these needs and perceptions may present conflicting demand, the policy researchers must still try to respond to them as much as possible.

Policy research explicitly incorporates values.

Policy research is a value laden process, in which many of the decisions involved in the research effort are driven by numerous and sometimes conflicting values. The values of the study users will enter into the process of defining the social problem, formulating research questions, developing recommendations from the findings, and disseminating the results to the selected audiences.

Purposes of Selected Research

Figure 2.5: Purposes of Selected Types of Research

Exploratory	Descriptive	Explanatory
Become familiar with the basic facts, setting, and concerns. Create a general mental picture of conditions. Formulate and focus questions for future research. Generate new ideas, conjectures, or hypotheses. Determine the feasibility of conducting research. Develop techniques for measuring and locating future data.	Provide a detailed, highly accurate picture. Locate new data that contradict past data. Create a set of categories or classify types. Clarify a sequence of steps or stages. Document a causal process or mechanism. Report on the background or context of a situation.	Test a theory's predictions or principle. Elaborate and enrich a theory's explanation. Extend a theory to new issues or topics. Support or refute an explanation or prediction. Link issues or topics with a general principle. Determine which of several explanations is best.

Time Dimension in Research

An awareness of how a study uses the time dimension help the researcher to conduct research. As a matter of fact, different research questions or issues incorporate time differently. Some studies give a snapshot of a single, fixed time point and allow us to analyze it in detail (cross-sectional). While other studies provide a moving picture that let us follow events, people, or social relations over several time points (longitudinal).

Cross-Sectional Research

Most social research studies are *cross-sectional*; they examine a single point in time or take a one-time snapshot approach. Cross-sectional research is usually the simplest and least costly alternative. Its disadvantage is that it cannot capture social processes or change. Cross-sectional research can be exploratory, descriptive, or explanatory, but it is most consistent with a descriptive approach to research.

Longitudinal Research

Researchers using *longitudinal research* examine features of people or other unit at more than one time. It is usually more complex and costly than cross-sectional research, but it is also more powerful and informative. Descriptive and explanatory researchers use longitudinal approaches. There are three main types of longitudinal research: time series, panel, and cohort.

Time-Series Study

A *lime-series study* is longitudinal research in which a researcher gathers the mime type of information across two or more time periods. Researchers can observe stability or change in the features of the units or can track conditions over time. The specific individuals may change but the overall pattern is clear.

Panel Study

The *panel study* is a powerful type of longitudinal research in which the researcher observes exactly the same people, group, or organization across multiple time points. It is more difficult to conduct than time-series research. Panel research is formidable to conduct and very costly. Tracking people over lime is often difficult because some people die or cannot be located. Nevertheless, the results of a well-designed panel study are very valuable.

Cohort Study

A *cohort study* is similar to a panel study, but rattier than observing the exact mime people, the study focuses on a category of people who share a similar life experience in a specified time period. Researchers examine the category as a whole for important features and focus 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, and all people who graduate in a given year. Unlike panel studies, researchers do not have to find the exact same people for cohort studies; rather, they need only to identify those who experienced a common life event.

Approaches of Research

Quantitative Research is labeled *quantitative* because it uses numbers to try to understand the process and the phenomena under study. In this approach, data are collected by conducting surveys in which respondents are asked the selected set of questions, or by making use of the numbers, or by otherwise

gathering information in a form that allows what is observed to be captured by numbers.

A quantitative approach is one in which the investigator primarily uses post-positivist claims for developing knowledge (i.e. cause and effect thinking, reduction to specific variables and hypotheses and questions, use of measurement and observation, and the test of theories). (Creswell, 2003, p.19)

In contrast, *qualitative* research makes use of words and sometimes images rather than numbers. Researchers may do in-depth interviews where each respondent is asked questions as they are in a survey, but as the interview proceeds, questions are tailored to what the respondent has already said. Researchers may do *observation* where they 'hang out' in a setting of interest to them and take careful notes about what is going on. Documents, including texts, photographs, and sound recordings may also be examined.

A qualitative approach is one in which the inquirer often makes knowledge claims based primarily on constructivist perspectives (i.e. the multiple meanings of individual experiences, meanings socially and historically constructed, with an intent of developing a theory or pattern) or advocacy/ participatory perspectives (i.e. political, issue-oriented, collaborative or change oriented) or both. (Creswell, 2003, p. 18). Qualitative research involves an interpretive, naturalistic approach to the world, studying things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them. (Denzin and Lincoln, 2000)

Since the 1970s, there has been some tension between 'quants' (those using numbers) and 'quals' (those not using numbers in their research). Until recently, most researchers were trained to use the tools of one approach but not the other. In extreme cases, a kind of intellectual xenophobia developed in which quals denied that quantitative research was valid, and quants denied the utility of qualitative research.

Contemporary research methods are breaking down the traditional barriers. For example, it is customary for qualitative researchers to use a convenience sample (interviewing whoever they can access easily) and quantitative researchers to use a probability sample (one in which everyone of the type of person being studied has a known chance of being interviewed). Kalof (1993) has shown how content analysis and statistical analysis can be joined to give a more thorough understanding of perceptions

of media images than either approach alone could do. McLaughlin (1996) combines a detailed historical account of the development of co-operatives with sophisticated statistical analysis of their findings and failures.

There is a range of arguments about the value of mixing qualitative and quantitative methods, many of which centre on the concept of triangulation and its value in validating data or analysis, or in gaining a fuller picture of the phenomenon under study (Bryman, 1998, 2004; Fielding and Schreier, 2001; Kelle, 2001; Mason, 2002a). The prime logical premise of using mixed method is that social experience and lived realities are multi-dimensional and enacted simultaneously at macro and micro scales, that our understandings are

Impoverished and may be inadequate if we view these phenomena only along a single dimension.

What has emerged now is *methodological pluralism*, which recognizes the importance of both qualitative and quantitative methods and those could contribute to interpret and understand social reality.

CHAPTER

3

Research Methods

CHAPTER 3

Research Methods

Research aims to help solve problems and investigate relationships of the numerous variables that exist around us. Research builds bodies of knowledge, contributes towards the development of literature of the professions and academic disciplines. As an investigative process, research takes place at different levels of scientific sophistication. Through conscious and deliberate intervention of research, different branches of discipline or areas of professional expertise have established different states of knowledge.

However, in the process of research, disciplines in natural sciences emphasizes on accurate prediction of what will happen and how to control events. Research in social sciences, in contrast, focuses on describing, understanding, analyzing and likely prediction of the social processes, dynamics and phenomena. It is normally very difficult to predict and explain social phenomena very specifically and precisely, and therefore, social researchers depend on different methodological approaches and logical treatment as compared with natural scientists. Even within social sciences, particular method or approach of research is more relevant to one level than the other depending on the nature of research, expected level of accuracy and the degree of anticipated internal and external validity.

Method versus Methodology

Methodology is the study of methods and deals with the philosophical assumptions underlying the research process, while a method is a specific technique for data collection under those philosophical assumptions.

Two broad methodological positions are generally discussed:

Positivism is the epistemological position that advocates the application of methods of the natural sciences to the study of social reality. It is based on ideas of objectivity (i.e., the objective reality of the physical world), scientific method, and empiricism.

Interpretivism assumes that social reality can only be understood through social constructions such as language, consciousness and shared meanings. Interpretive research does not predefine variables, but explores human sense-making in naturalistic settings. According to this view, the social scientist should grasp the subjective meaning of social action.

Research Method Defined

Research method is the functional action strategy to carry out the research in the light of the theoretical framework and guiding research questions and or the (imposed hypotheses).

Research Method, therefore, is a planned and systematic approach of Investigation that denotes the detail framework of the unit of analysis, data gathering techniques, sampling focus and interpretation strategy and analysis

Selection of Research Method

There is no single rule to choose a research method out of very many options. However the broad research goal somehow gives a general indication about the possible research method to be followed for the proposed study. Different research problems have different research goals, which in turn call for different research methods. Choice of research method is guided not merely by the researcher's field of interest or specialization but also by the nature of the problem being studied, the research goals and the level of accuracy wanted. Experience has established the fact that use of one single method in social research is not always enough to respond to the research need rather a combination of methods is more useful to bring desired level of methodological sophistication.

There are at least three points that should be borne in mind while choosing an appropriate research method (Bennett; 1983:85)

Answering the research question

The method must allow the research question to be answered. It is unquestionably important to know and understand thoroughly what questions the researcher is seeking to answer. A clear statement of the research questions will enable both the level of research and the level of rigor to be needed for the study. It will also enable a check to be made on the understanding of the nature of the research problem involved.

Current state of knowledge

The present state of art of a particular body of knowledge is also important in determining the research method. If little is known about the variables Involved in the research problem then more qualitative and exploratory type of research methods are needed. If, on the other hand, a review of literature shows that a good deal is already known and it is possible to isolate the key variables' Involved in the process, then explanatory and experimental type of research methods can be opted. However, even where the variables are

known in advance, their nature may prevent the use of experimental research methods.

The nature of the variables involved

The choice of a method is governed by the extent to which the variables can be manipulated and measured in a controlled manner. In the natural sciences, it is often possible to make the subject of the research to do what the researcher wants to do. On the other hand, in social sciences, this is not always possible.

Broadly speaking, a choice must be made between an experimental or non-experimental approach. Moreover, the particular design, or strategy, to be followed will be selected from a variety of available models or constructs to suit the situation.

For the purposes of evaluating the alternative research methods, the following questions should be considered:

What is the universe to which the researcher wishes to generalize the results? (Universe refers to the totality of subject under study).

What level of accuracy is expected out of the method? and how much bias would be tolerated ?

What is the maximum sampling error that would be allowed?

If a particular method is to be employed, will it be within the time and financial limitations set for the study?

Selected Methods in Social Research

It should be recognized that different research problems imply different research goals, which in turn, call for varied methods and techniques. Choices are guided not merely by the investigator's discipline or field, though this will undoubtedly influence his thinking, but also by the nature of the problem and its related research goals.

Content Analysis

Content Analysis is a research technique for the objective, systematic and quantitative description of the manifest content of certain communication (Berelson;1952:16). Content analysis method critically and objectively reviews the published or printed facts, figures, opinions, observations, generalizations in the light of its content value (Wilkinson; 1982:156).

Content analysis is a research tool used to determine the presence of certain words or concepts within texts or sets of texts. Researchers quantify

and analyze the presence, meanings and relationships of such words and concepts, then make inferences about the messages within the texts, the writer(s), the audience, and even the culture and time of which these are a part. Texts can be defined broadly as books, book chapters, essays, interviews, discussions, newspaper headlines and articles, historical documents, speeches, Conversations, advertising, theater, informal conversation, or really any occurrence of communicative language. To conduct a content analysis of any text, the text is coded, or broken down, into manageable categories on a variety of levels-- word sense, phrase, sentence, arguments, or theme and then examined using one of content analysis' basic methods: conceptual analysis or relational analysis.

Content Analysis has an important place in the methodology of investigation. Firstly, it is capable of accepting relatively unstructured symbolic Communications as data and, secondly, of analyzing unobserved phenomena, regardless of whatever language is involved.

Herelson (1952) prescribes a comprehensive list of the use of content analysis. According to him content analysis attempts to:

- describe trends in communication content;
- trace the development of scholarship;
- disclose international difference in communication content;
- compare media or "levels" of communication;
- audit communication content against objectives;
- construct and apply communication standards;
- aid in technical research operations;
- expose propaganda techniques;
- measure the "reliability" of communication materials;
- discover stylistic features;
- determine the psychological state of persons or groups;
- detect the existence of propaganda;
- secure political and military intelligence;
- reflect attitudes, interests, and values of population groups;
- reveal the focus of attention;
- describe the attitudinal and behavioral response to communication.

Almost similarly, Holsti (Holsti; 1962) broadly identifies three principal purposes of content analysis.

As a research method it attempts to:

- describe characteristics of communication - asking what, how, and to whom something is said.
- make inferences as to the antecedents of communication - asking why something is said.
- make inferences as to the effects of communication - asking with what effects something is said.

Different writers have identified and classified different types and applications of content analysis. Janis (1965) offers the following classification:

Pragmatic Content Analysis

Procedures which classify signs according to their probable causes or effects (e.g., counting the number of times that something is said which is likely to have the effect of producing favorable attitudes towards some subject matters in a given audience).

Semantical Content Analysis

Procedures which classify signs according to their meanings, i.e., counting the numbers of the subject matter that is referred to.

Sign-vehicle Analysis

Procedures which classify content according to the psycho-physical properties of the signs, (e.g., counting the number of times the particular subject word appears).

The research procedures involved in the content analysis of books, magazines, research articles, newspaper, film, Radio-TV, program etc. consists of utilizing a system of categorization on the basis of which the communication or documentary content is analyzed quantitatively and qualitatively and this in turn, is geared to test hypothesis that the researcher sets before himself. The important point about content analysis is that content of communication is analyzed by means of systematic predetermined categories based on themes, value intents and style etc. which often yield quantitative results.

Components of Content Analysis

Content analysis as a research method involves the following four steps: *First*, data sources are identified, unitized and categorized; *second*, validity of the data and information is examined; *third*, collected data and

information are then categorized and examined in the light of theory and knowledge about the data context; fourth after analysis-inferences and conclusions are drawn based on the broad questions as what, why and with what effects. Procedurally organizing data for content analysis is composed of two components:

- Unitization of data and
- Categorization of data.

Unitization of data: All attributes and variables under study should be precisely identified, defined, specific indicators are to be set and corresponding data should be specified.

Categorization: An operational definition for each category has to be made. The categories must form a continuum, i.e., an identifiable and logically related series. Coding of qualitative materials is done by recording the presence or absence of an attribute.

Data in content analysis typically derive from complex symbolic forms of an Indigenous language. Private notes, literature, theater, television drama, small group interactions, films, political speech, historical documents, interviews, advertisement, and even cartoons could be used as sources of data.

Principles of Content Analysis

Principle of Selection

Selection of content should be done with great care. A faulty selection may result in an erroneous generalization.

Principles of Authenticity

The source should be authentic. Validity of the claim of authorship should be cross checked. Before accepting the content as source of information one must question how authentic is the source.

Principle of Objectivity

The researcher at the outset must raise the following critical questions : Does the content reflect an emotional and biased picture? Does the content show sign of exaggeration? Does the content ignore the validity of established law and or acknowledged principles?

Limitations of Content Analysis

It is really difficult to determine the reliability of the content analysis procedures.

- Sometimes researchers select content that is easily available but does not represent an unbiased sample of all contents related to the research objectives.
- Different classifications or categories that have been used in content analysis are not sufficiently specific and comprehensive.
- Difficulties in drawing a sample plan to collect data/ information. Classification and categorization of the content is also fairly difficult.

Descriptive Method

This method of research is widely used by social sciences researchers. Experts on research methodology are, however, not quite in agreement on what constitutes descriptive research. Most often the term is broadened to include all forms of research except historical and experimental (Leedy:1980).

The word descriptive derives from the *de*, meaning "from", and *scribere*, "to write." The term therefore describes the essential character of the method. In applying this method the researchers do two things: first, they observe with close scrutiny the population bounded by the research parameter, secondly, they make careful record of what they have observed. This method of social research attempts to describe systematically the facts and characteristics of a given population or area of interest factually and accurately.

The descriptive research deals with a situation that demands the technique of observation as principal means of collecting data. The population of the study are carefully chosen, clearly defined and specifically delimited in order to set precise parameters for ensuring discreteness to the population.

Descriptive research is used in the literal sense for describing situations or events. It is the accumulation of a data base that is solely descriptive - it does not necessarily seek or explain relationships, test hypotheses, make predictions, or get at meanings and implications.

Descriptive research has the following specific purposes:

- To collect detailed factual information that describes existing phenomena;

- To identify problems or justify current conditions and practices; To make comparison and evaluation;
- To determine what others are doing with similar problems or situations and benefit from their experience in making future plans and decisions.

Limitations of Descriptive Research

Most of Researchers do not formulate clear and specific objectives of a descriptive research. Moreover data and information those are gathered usually found to be very much qualitative by nature.

- Researcher in this type of research usually relates his data-gathering procedure to his objectives in only a customary manner and thereby fails to get quantitative data specific to his problem.
- Sample is selected on the basis of convenience rather than attempting to obtain a random sample.
- It is difficult to structure the data collecting devices like questionnaires, interview guides, observation forms. As a result in many cases data gathered are found to be vague and result in biased or misleading conclusions.

Survey Method

Survey method is most widely used in social science[^] research. It is probably the best method available to the social scientists interested in collecting original data for purposes of describing a population too large to observe directly. Surveys are widely used to collect information and observations over time. Such longitudinal analysis enables the researchers to identify not only the variables which are related to each other but also how those' relationships change over time.

The word 'Survey' is composed of two Latin words "*Sur*" and "*Vor*." *Sur* is derivative of Latin *super*, meaning "*above*" or "*beyond*"; *Vor* comes from Latin verb *videre*, meaning "to look" "to see". Thus the integrated word survey means "to see or look over or beyond" or to see something from a high place. In social sciences, it refers to the technique of collection of data through interview, questionnaire, secondary sources in the light of a specific research objective. A typical definition of social survey is given by Mark Abrams. He defines social survey as "a process by which quantitative facts are collected about the social aspects of a community position and activities" (Abrams; 1951:29). It is to be noted that surveys could be very well used for descriptive, explanatory and exploratory researches.

As a matter of fact, any social survey research is first and foremost a study of people. In some cases the study is descriptive, aiming at an accurate quantitative description of the population under study. The general purpose of survey is simply to generate and provide someone with information. Survey can be used for two quite different purposes. The first is to describe the current practices and events. Such as polls. The purpose of polling survey is mainly to distribute responses or answers to an item. They can be used to determine the extent to which certain practices are common or certain trends becoming apparent. They can be used to compare practices among two different observing units. They are therefore valuable for establishing a body of data on which to base comparison. A second use of the survey is for analysis. Analytical Surveys go beyond simply describing the current state of practice. It enables us to establish relationships between variables.

Survey research in general, has the following specific advantages (Ghosh; 1982);

- Social survey is more reliable than any other method as it is quantitative and mostly primary in character.
- It helps us in getting more reliable data and well organized information on particular problem.
- Through social survey, a researcher or an investigator comes in direct contact with the people from whom he collects the information. In this process, the new facts of life can be gathered, on the basis of which new theories can be developed.
- It is an excellent vehicle for measurement of attitudes and orientations prevalent within a large population. Public polls are the well known example of this.

Limitations of Survey Method

- The main drawback of survey is that it involves a large amount of money.
- This method is time-consuming.
- Data collected through survey is not always reliable.
- Sometimes the results obtained from the study become too general.
- Since survey is conducted on sampling basis, it may involve sampling error.

- Survey method does not necessarily take into account the historical perspective.
- The method emphasizes, in most cases, only on immediate problems.

Historical Method

History may be defined as an integrated narrative or description of past events or facts, written in the spirit of critical inquiry to find out the whole truth and report it (Asubel; 1959).

Past experiences and knowledge always provide us with wide variety of options to choose our present actions. In other words, present actions are nothing but the reflection of past experiences. Historical method is the means by which the researcher deals with the latent meaning of history. The historical method aims to assess the meaning and to read the message of the happenings in which human being, the events of their lives, and the life of the world around them relate meaningfully to each other.

Historical method of research aims to reconstruct the past objectively and accurately, often in relation to the tenability of hypothesis. Historical method is the induction of principals through research into the past and social forces which have shaped the present. The main objective of the method is to provide a means through which researcher may deal with problems that arise from events that happened in the past and to interpret what might otherwise be considered merely as the past instances. In other words historical method is a mean to examine the matter of various social problems by discovering the past trends, facts, events and occurrences - and to predict the possible trends in that particular line (Leddy; 1980).

The purpose of historical method is therefore, to reconstruct the past systematically and objectively by collecting, evaluating, verifying and synthesizing evidence to establish facts and reach defensible conclusions, often in relation to particular hypothesis.

Historical research depends upon data observed by other rather than by the investigator. Good data result from painstaking detective work which analyzes the authenticity, accuracy, and significance of source material.

Historical Research depends upon two kinds of data: primary sources where the author was a direct observer of the recorded event, and secondary sources where the author is reporting the observations of others and is one or more times removed from the original event. Of the two, primary sources carry the authority of first hand evidence and have priority in data collection.

Historical research and historiography involve three major steps (Good;1959:122):

1. Collection of data, with consideration of sources as documents and remains or relics, and as primary and secondary.
2. Criticism of the data, including the process of external criticism (questions of authorship, time, place genuineness, and actual language or text of the original document) and the process of internal criticism (questions of accuracy and value of the statements made).
3. Presentations of the facts in readable narrative form, including problems of organization, composition, exposition, and interpretation.

Sources of Historical Data

Following is an elaborate list of the classification of historical data sources (Barrzen and Graff ;1957:43):

- Physical remains: historic sites, roads, aqueducts, pyramids, fortifications, buildings ruined or whole, furniture, human remains, clothing, food, utensils, pottery, implements, weapons, machinery, industrial processes, and fine arts and museum pieces of many kinds.
- Orally transmitted materials: such as folklore, legends, ballads, tales, anecdotes, sagas, traditions, customs, manners, burials, ceremonials, social institutions and languages.
- More elementary and durable kinds of representative or inscription-,baked upon clay, chiseled stones, monuments, stamped coins, woven tapestries, vases, scenic or portrait sculptures, historical paintings, and portraits.
- Handwritten materials, including papyri, bricks bearing cuneiform writing, vellum or parchment manuscript, and such more recent documents as chronicles, annals, biographies, memoirs, dairies, and genealogies.
- Printed books, papers and literature.
- Motion picture films, microfilms, and recordings including radio and television.
- Personal observation by the researcher or, by people whom he interviews.

Limitations of Historical Method

- As research method it can be used where there is sufficient historical data and evidence are available to conduct a worthwhile study or test the hypothesis adequately.
- Excessive use of secondary sources of information in particular makes this method vulnerable. Very often the sources of information and its validity are challenged.
- It is very difficult to develop a specific research question which often results in attempts to work on a broad and poorly defined problem.
- It is very difficult to evaluate authenticity of the historical data and information.
- Historical analysis in some sense is a systematic but narrative account of the past and therefore there is a considerable scope for personal bias in analyzing the content.
- In most cases these researches recite facts and due to lack of concrete evidence or authenticity, do not synthesize or integrate these facts into meaningful generalizations.

The Case Study

The term "case study" usually refers to a fairly intensive examination of a single unit, such as a person, a small group of people or indeed a single organization. Case studies involve measuring and studying what is there and how it got there. In this sense it is historical. It can enable us to explore, reveal and understand problems, issues and relationships.

Case studies involve an in-depth examination of a single person or a few people. The goal of the case study is to provide an accurate and complete description of the case. The principal benefit of case studies is that they can expand our knowledge about the variations in human behavior. Although experimental researchers are typically interested in overall trends in behavior, drawing sample-to- population inferences, and generalizing to other samples, the locus of the case-study approach is on individuality and describing the individual as comprehensively as possible. The case study requires a considerable amount of information, and therefore conclusions are based on a much more detailed and comprehensive set of information than is typically collected by experimental and quasi-experimental studies. Case studies of individual participants often include in-depth interviews with participants and collaterals (e.g., friends, family members, and colleagues), review of medical records, observation, and

excerpts from participants' personal writings and diaries. Case studies have a practical function in that they can be immediately applicable to the participant's diagnosis or treatment. According to Yin (1994), the case-study design must have the following five components: its research question(s), its propositions, its unit(s) of analysis, a determination of how the data are linked to the propositions, and criteria to interpret the findings. According to Kazdin (1982), the major characteristics of case studies are the following:

- They involve the intensive study of an individual, family, group, institution, or other level that can be conceived of as a single unit.
- The information is highly detailed, comprehensive, and typically reported in narrative form as opposed to the quantified scores on a dependent measure.
- They attempt to convey the nuances of the case, including specific contexts, extraneous influences, and special idiosyncratic details.
- The information they examine may be retrospective or archival.

Although case studies lack experimental control, their naturalistic and uncontrolled methods have set them aside as a unique and valuable source of information that complements and informs theory, research, and practice (Kazdin, 2003c). According to Kazdin, case studies may be seen as having made at least four substantial contributions to science: Case studies serve as a source of research ideas and hypotheses; It helps to develop therapeutic techniques; case studies have enabled scientists to study extremely rare and low-base-rate phenomena, including rare disorders and one-time events; and case studies can describe and detail instances that contradict universally accepted beliefs and assumptions, thereby serving to plant seeds of doubt and spur new experimental research to validate or invalidate the accepted beliefs.

Case studies also have some substantial drawbacks. First, like all non-experimental approaches, they merely describe what occurred, but they cannot tell us why it occurred. Second, they are likely to involve a great deal of experimenter bias. Although no research design, including the randomized experimental designs, is immune to experimenter bias, some, such as the case study, are at greater risk than others. The reason the case study is more at risk with respect to experimenter bias is that it involves considerably more interaction between the researcher and the participant than most other research methods. In addition, the data in a case study come from the researcher's observations of the participant. Although this might also be supplemented by test scores and more objective measures, it is the

researcher who brings all this together in the form of a descriptive case study of the individual(s) in question. Finally, the small number of individuals examined in these studies makes it unlikely that the findings will generalize to other people with similar issues or problems. A case study of a single person diagnosed with a certain disorder is unlikely to be representative of all individuals with that disorder. Still, the overall contributions of the case study cannot be ignored. Regardless of its non-experimental approach—in fact, *because* of its non-experimental approach—it has substantially informed theory, research, and practice, serving to fulfill the first goal of science, which is to identify issues and causes that can then be experimentally assessed.

The case study approach offers a means of organizing social data with the view to preserving the wholeness of the social object being studied. The social object may be a person, a family, a social group or process or a culture. Whereas in other research methods, the individual unit disappears from the analysis and becomes simply a set of traits individually tabulated, the case study approach attempts to keep together as a unit, those characteristics and traits describing the object. From the study of cases, the social scientist tries to abstract those properties that are common to, or typical of, many cases from those which are peculiar only to the exceptional cases. He is interested in being able to generalize and to construct types based on his depth study of empirical cases. This abstracted unit, or model, is amenable to reconstruction and reformulation as new information is obtained (Doby: 1967).

The case study approach provides the researcher a wide range and depth of experience. Absorption and probing into the cases gives him new insights into the pattern, structure, and peculiarities found in the data.

Case studies are particularly useful as background information for planning major investigations in the social sciences. Because they are intensive, they bring to light the important variables, processes, and interactions that deserve more extensive attention. They pioneer new ground and often are the sources of fruitful hypotheses for further study.

Case study data provide useful anecdotes or examples to illustrate more generalized statistical findings. The Case study method has three steps. The *first* is determining the present situation. The research worker may have only vague impression of the research problem. He needs descriptive information which will determine as clearly and accurately as possible the present status and circumstances of the case being investigated. The *second* step is to gather background information about the past and the key

variables. The researcher often compiles a list of possible causes of current situation. The *Third* step is to test hypothesis. The background information collected may form few possible hypotheses. At this stage, specific evidence about each of these hypotheses can be gathered. This stage aims to eliminate possibilities which conflict with the evidence collected and to gain confidence for the important hypotheses. The culmination of this stage might be the development of an experimental design to test out more rigorously the hypotheses developed, or it might be to take action to resolve the problem.

Limitations of Case Study

Because of their narrow focus on a few units, case studies are limited in their representativeness. They do not allow valid generalizations to the population from which their units have been drawn until the appropriate follow-up research is accomplished, focusing on specific hypotheses and using proper sampling methods.

Case studies are particularly vulnerable to subjective biases. The case itself may be selected because of its dramatic, rather than typical attributes; or because it neatly fits the researcher's preconceptions. To the extent selective judgments rule certain data in or out, or assign a high or low value to their significance, or place them in one context rather than another, subjective interpretation is influencing the outcome.

Discourse Analysis

It is difficult to give a single definition of Discourse Analysis as a research method. Discourse Analysis can be characterized as a way of approaching and thinking about a problem. In this sense, Discourse Analysis is neither a qualitative nor a quantitative research method, but a manner of questioning the basic assumptions of quantitative and qualitative research methods. Discourse Analysis does not provide a tangible answer to problems based on scientific research, but it enables access to the ontological and epistemological assumptions behind a project, a statement, a method of research. It is nothing more than a deconstructive reading and interpretation of a problem or text.

Discourse analysis is the collection and critical assessment of the conversation or text on certain thematic area of concern. Discourse Analysis is basically the debate / approaches of dealing textual phenomena involved in the creation of public and private meaning and understanding on a particular issue.

Discourse analysis or discourse studies, is a general term for a number of approaches to analyzing written, spoken or signed language use on

certain social, political, economic issue, concept or debate. Discourse analysis is a way of understanding social interactions.

Discourse analysis is about trying to identify meaningful categories or themes in a body of data. By looking at the text, the researcher asks whether a number of recurring themes can be abstracted about what is being said. For example, on one level we might find an inconsistency, an attempt to assign blame, an attempt to cite others to support one's views, a regular interruption of other people, an attempt to make one's account of some event sound more authentic, and so on. On another level, the researcher might identify a regularly occurring attribution of blame or the repeated reference to some specific cause of an event.

Discourse Analysis broadly covers social problems and political issues, current paradigms and debates. Thus it is multi-disciplinary in approach. It attempts to *describe* discourse structures and tries to *explain* them in terms of properties of social interaction and especially social structure. More specifically, Discourse analysis focuses on the ways discourse structures enact, confirm, legitimate, reproduce, or challenge relations of *power* and *dominance* in society. Discourse analysis primarily aims to present : a. propositional and figurative meaning and dimensions of problem or issue, b. argumentative strategies, c. pre-suppositions and expectations, d. individual and group identity and arguments, e. social and political structure and , f. power and prestige relationships, and g. discourse on society and culture.

Discourse Analysis generally does not provide absolute answers to a specific problem, but enables us to understand the conditions behind a specific "problem" and makes us realize that the essence of that "problem", and its resolution, lies in its assumptions; the very assumptions that enable the existence of that "problem". By enabling us to make these assumptions explicit, Discourse Analysis aims at allowing us to view the "problem" from a higher stance and to gain a comprehensive view of the "problem" and ourselves in relation to that "problem". Discourse Analysis is meant to provide a higher awareness of the hidden motivations in others and ourselves and, therefore, enables us to solve concrete problems - not by providing unequivocal answers, but by making us aware of ontological and epistemological questions.

Focused Synthesis

Focused synthesis is somewhat akin to traditional literature reviews by involving the selective review of written materials and existing research findings relevant to the particular research topic (Doty; 1982). However, focused synthesis differs from traditional literature reviews by discussing information obtained from a variety of sources beyond published articles. For example, a typical synthesis might include discussions with experts and

stakeholders, legislative hearings, anecdotal stories, personal past experience of the researchers, unpublished documents, staff memoranda, and published materials. Another way that focused synthesis differs from traditional literature review is in its purpose. Literature reviews tend simply to describe sets of research studies and identify gaps or areas needed more research. While focused synthesis will generally describe its sources, information sources are used only to the extent to which they directly contribute to the overall synthesis. A final way in which focused synthesis and literature reviews differ is in the extent to which they stand alone. Most traditional literature reviews are used as precursors or background for later research. Gaps identified by review are presumably filled by subsequent data collection efforts. In contrast, focused synthesis tends to be used alone in a technical analysis. The recommendations presented are derived exclusively from the synthesized information, with no primary data collected. Since the recommendations are based solely on the information used in the focused synthesis, such a research effort is constrained by both availability and timeliness of the information. Nevertheless, focused synthesis provides with an advantage over other methods in that it can be performed in an efficient and opportune fashion.

Focus Group Discussion

Focus groups are formally organized, structured groups of individuals are brought together to discuss a topic or series of topics during a specific period of time. Like surveys, focus groups can be an extremely useful technique for obtaining individuals' impressions and concerns about certain issues, services, or products. Originally developed for use in marketing research, focus groups have served as a principal method of qualitative research among social scientists for many decades. In contrast to other, unilateral methods of obtaining qualitative data (e.g., observation, surveys), focus groups allow for interactions between the researcher and the participants and among the participants themselves.

Like most other qualitative research methods, there is no one definitive way to design or conduct a focus group. However, they are typically composed of several participants (usually 6 to 10 individuals) and a trained moderator. Fewer than 6 participants may restrict the diversity of the opinions to be offered, and more than 10 may make it difficult for everyone to express their opinions comprehensively (Hoyle, Harris, & Judd, 2002). Focus groups are also typically made up of individuals who share a particular characteristic, demographic, or interest that is relevant to the topic being studied. For example, a marketing researcher may want to conduct a focus

group with parents of young children to determine the desirability of a new educational product. Similarly, a criminal justice researcher interested in developing methods of reducing criminal recidivism may choose to conduct focus groups with recent parolees to discuss problems that they encountered after being released from prison. The presence of a trained moderator is critical to the focus-group process (Hoyle et al, 2002). The moderator is directly responsible for setting the ground rules, raising the discussion topics, and maintaining the focus of the group discussions. When setting the ground rules, the moderator must, above all, discuss issues of confidentiality, including the confidentiality of all information shared with and recorded by the researchers (also covered when obtaining informed consent). In addition, the moderator will often request that all participants respect each other's privacy by keeping what they hear in the focus groups confidential. Other ground rules may involve speaking one at a time and avoiding criticizing the expressed viewpoints of the other participants. Considerable preparation is necessary to make a focus group successful. The researcher must carefully consider the make-up of the group (often a nonrepresentative sample of convenience), prepare a list of objectives and topics to be covered, and determine clear ground rules to be communicated to the group participants. When considering the questions and topics to be covered, the researcher should again take into account the make-up of the group (e.g., intelligence level, level of impairment) as well as the design of the questions. For example, when possible, moderators should avoid using closed-ended questions, which may not generate a great deal of useful dialogue. Similarly, moderators should avoid using "why" questions. Questions that begin with "why" may elicit socially appropriate rationalizations, best guesses, or other attributions about an individual's behavior when the person is unsure or unaware of the true reasons or underlying motivations for his or her behavior (Nisbett & Wilson, 1977). Instead, it may be more fruitful to ask participants about what they do and the detailed events surrounding their behaviors. This may ultimately shed more light on the actual precipitants of participants' behaviors. Overall, focus groups should attempt to cover no more than two to three major topics and should last no more than 1 to 2 hours. The obvious advantage of a focus group is that it provides an open, fairly unrestricted forum for individuals to discuss ideas and to clarify each others' impressions and opinions. The group format can also serve to crystallize the participants' opinions. However, focus groups also have several disadvantages. First, because of their relatively small sample sizes and the fact that they are typically not randomly selected, the information gleaned from focus groups may not be

representative of the population in general. Second, although the group format may have some benefits in terms of helping to flesh out and distill perceptions and concerns, it is also very likely that an individual's opinions can be altered through group influence. Finally, it is difficult to quantify the open-ended responses resulting from focus group interactions.

The information obtained from focus groups can provide useful insight into how various procedures, systems, or products are viewed, as well as the desires and concerns of a given population. For these reasons, focus groups, similar to other qualitative research methods, often form the starting point in generating hypotheses, developing questionnaires and surveys, and identifying the relevant issues that may be examined using more quantifiable research methodologies.

Scenario Building

This is an emerging approach of social research. In research topics where empirical data and information are not readily available or missing, in order to give a projective analysis and interpretation of the phenomena under study, the researcher depends largely on his past experiences, analysis of the current processes, review of the trends and sometimes consultation with experts. Scenario building is generally used in the study of Political Sciences, International Relations or even in Management Studies in areas of crisis and disaster management, organization development and change, organization behavior analysis etc. Following are examples of few questions which could be used as lead questions in developing specific scenario building exercise. What will be the impact of the South and North Korean integration on Bangladesh national economy? What happens if Chittagong Port remains closed for four months due to natural calamity? What happens if China attacks India? What will be the motivational impact on the public officials if the current housing allowance is withdrawn? What will be the consequences of the introduction of Value added tax on agricultural products etc?

In such questions there are no fixed or absolute answers - there are indeed lot of information gaps. Over and above, it may simply not happen or take place. The questions are leading the researcher completely to an imaginary situation. Obviously in answering the above questions or questions of similar nature, the researcher to a great extent depends on his imaginary and creative thinking and draws a make-believe projective scenario. In doing so the researcher primarily depends on his personal experiences, related past information, analysis of historical trends if any,

and extensive use of content analysis of somehow relevant and available literature. Nevertheless since the whole exercise is completely futuristic by nature, the researcher solely relies on his personal creativity and imagination and logical understanding of the phenomena.

Scenario building in general, could be identified as a qualitative approach of social research. The researcher paints a canvass of future events using his skill of projections, linking the relevant and or disjointed events, perspective, and understanding of contemporary overt and or covert dynamics of the related matters. It is often impossible to carry out research with a single method. Considering the limitations of the respective research methods it is advantageous for the researcher to combine different methods and develop an appropriate strategy for research. However, pertinence and validity of the research findings to a great extent depend on how appropriately the research method is chosen. Sophistication and degree of precision of the chosen research method therefore guarantee the quality and both internal and external validity of the research findings. A researcher while designing his or her research proposal, therefore, must be cautiously guided by the limitations and flaws of the chosen research method(s) and incorporate adequate checks and balances in the management of the research processes.

Use of Library in Social Research

Library is the store house of knowledge. It is a place that systematically keeps the various secondary sources of data and information. Whatever research method is chosen all researchers at one stage or other need to use library to gather data or reference support. However, one has to be fairly systematic to gather data and information from the library. The first step to get acquainted with the library is to develop a clear understanding about the card catalogue system of the library.

Card Catalogue

The card catalogue is the heart of the library. It is the principal means of locating the library's holdings. The catalogue is a series of drawers containing 3X5" inches index cards on which one finds the location and a description of all that the library contains. As a general index to the library resources, the card catalogue alert the researcher to various kinds of materials available: books, filmstrips, tapes, phonograph record, microfilm, microfiche, microprint, maps, pictures, slides and other similar materials.

All these information are catalogued by:

- author analytical cards

- title analytical cards. *Rules for Catalogue*

The card catalogue is arranged alphabetically, by author, title, and subject, but certain rules of precedence within the alphabetical framework are observed by librarians in placing the cards in the catalogue. These rules are:

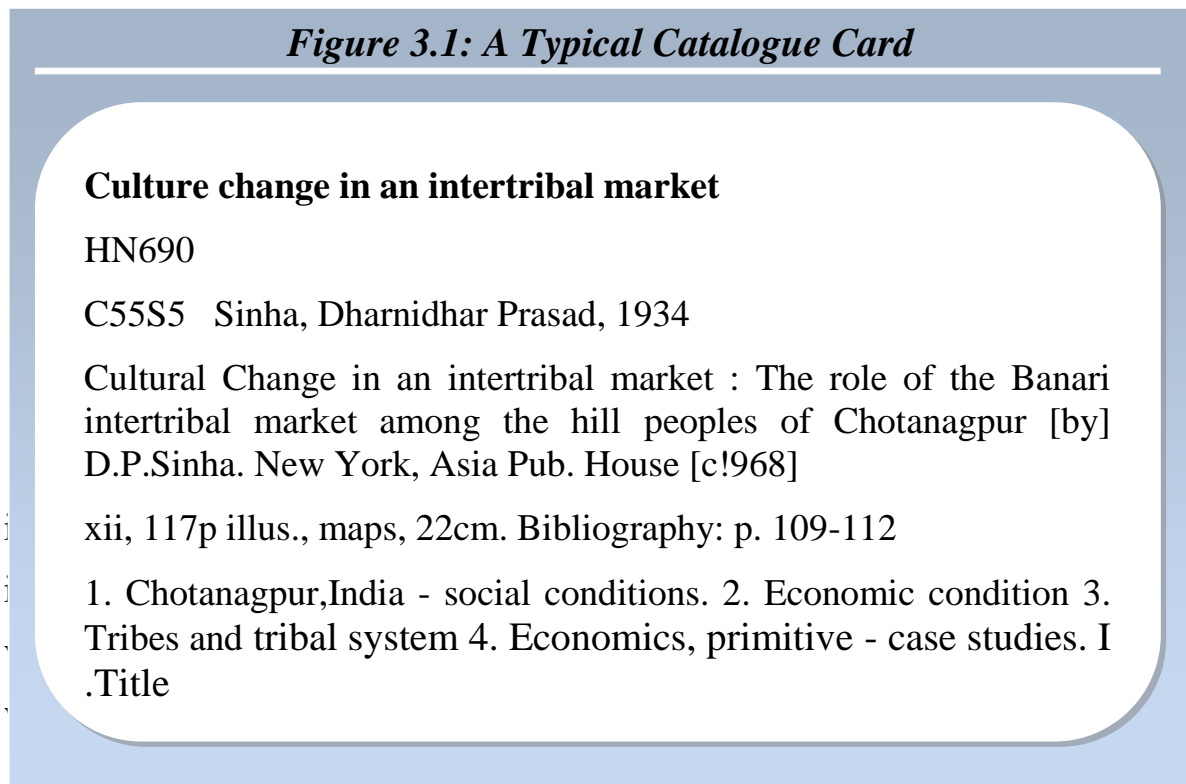
- Books by person precede books *about* person,
- Collected works usually precede individual works.
- When the same words are common to (i) a person, (ii) a place, and (iii) a thing, the cards will be arranged in sequence of that order.

Each catalogue card contains three separate categories of information:

- Identification information for the particular book.
- The description of the book and its contents.
- Classification information for the librarians.

Following are the specific information items that are found in a catalogue card: i. The classification of the book in terms of its subject matter, ii. The author's name, together with birth date, iii. The call number, iv. The title of the book followed by sub-titles, v. The copy right date. Information regarding date publication.

Figure 3.1: A Typical Catalogue Card



vii. The height of the book as it stands on the shelf, viii. Indication about the attached bibliography ix. Categories under which the book has been catalogued, x. Library of Congress call number, xi. The Dewey Decimal call number, xii. Indicate the publisher of the card.

Figure 3.2 : Comparative Classification System

DC	Subject	LC	DC	Subject	LC
630	Agriculture	3	400	Language	P
570	Anthropology	3N	540	Law	
913	Archaeology	CC	020	Library Science	Z
700	Art	N	800	Literature	
220	Bible	BS	810	Literature, Amer.	
010-020	Bibliography	Z	820	Literature, Eng.	
920,92	Biography	CT	840-860	Literature, Romance	PQ
560	Biology	QH	658	Management	
580	Botany	QK	510	Mathematics	QA
650	Business	HF	610	Medicine	R
540	Chemistry	QD	355-358	Military Science	
155.4	Child Development	BF	780	Music	M
260-270	Church History	BR	560	Natural Science	QH
330	Economics	HB-HJ	359	Naval Science	
370	Education	"L	610	Nursing	RT
378	Education, Higher	ID	750	Painting	
030	Encyclopedias	AE	615	Pharmacy	u"
400	English	PE	100	Philosophy	B
600	Engineering	T	770	Photography	mn
700	Fine Arts	N	530	Physics	QC
440	French Language	PC	320	Political Science	J
000	General	A	150	Psychology	BF
910	Geography	G	200	Religion	B
550	Geology	QE	500	Sciences	Q
430	German Language	PF	730	Sculpture	NB
740	Graphic Art	NC	300	Social Science	H
480	Greek Language	PA	301-309	Sociology	HM-HX
930-960	History (except US)	D	460	Spanish Language	PC
970-980	History (US, Gen)	E	790	Sports	GV
640	Home Economics	IX	310	Statistics	HA
070	Journalism	PN	230	Theology	BT
			590	Zoology	OL

Perhaps the most important feature of the catalogue card is the classification symbol found in the upper left corner of the card. The symbol, known as the

Cull number, indicates where the book or the material will be found in the library stacks and the type of material it contains. The *call number* will belong either to the Dewey decimal classification system or Library of Congress classification system.

Different libraries may have different types of classification system. The principal classification systems are:

- a. Dewey Decimal Classification (DC);
- b. Library of Congress Classification (LC).

In Dewey Decimal system, books are catalogued and shelved according to ten basic areas of human knowledge and subsequent sub-areas, each divided decimally. On the other hand in Library of Congress classification system, books are assigned to particular areas of human knowledge, which are given special alphabetical categories. Previous Figure 3.2 shows the distribution of classification.

Index

The index supplements the card catalogue. They are found on the reference shelves of the library. There are several types of index in a library like periodical index, subject index etc. Periodical Index serves as guides to the contents of periodicals, just as the card catalogue serves as guide to the books available in the library.

Reference Room

The general reference room of a library contains volume of reference works essential to the researchers. From the mass of information concentrated at the reference room, the researcher can obtain volumes of supportive materials. A researcher normally finds two classes of volumes for reference : encyclopedic works; and guides to special subjects. Most common and widely used general encyclopedic works include the following: i. Collier's Encyclopedia; ii. Columbia Encyclopedia; iii. Encyclopedia Britannica; iv. Encyclopedia Americana; v. The Macmillan Everyman's Encyclopedia, vi. The Encyclopedia of Social Sciences.

Steps in Library Research

In a typical library research one can follow three steps : First, Preparation of a tentative bibliography; this means the researcher familiarize himself with the broad field of scholarship which include the subject matter he intends to deal with and prepares a extensive list of secondary materials. Most libraries have annotated subject bibliographies of reference books that help the researchers.

Second, after thorough readings, information are recorded for future use. Information are of course gathered in the light of the research question and the specific indicators that have been established at the beginning of the research. Following principles should be followed in recording information.

- i. Each record or note should be taken on a separate sheet of paper or card,
- ii. Each recorded entries should be complete and accurate.
- iii Names of the sources, reference numbers and other relevant information should be clearly written so that the noted record could be traced back later for verification and cross reference.

Evaluation of the records is the third step of library research. Each information and data collected has to be examined in terms of its accuracy and dependability, up-to-dateness and methodological treatment.

Review of Literature

Literature reviews help researchers limit the scope of their inquiries, and allow the researchers to convey the importance of studying a topic to the readers. Review of literature helps the researchers make preliminary choices to research topics before launching into a research proposal. It also helps the researcher to assess whether the topic can and should be researched on. The format of a review of literature may vary from discipline to discipline and from assignment to assignment.

Purposes of Review of Literature

The prime purpose of review of literature is to tap the findings of other researchers or studies that are closely related to the study being in process. It attempts to analyze critically a segment of a published body of knowledge through summary, classification, and comparison of prior research studies, reviews of literature, and theoretical articles. Review of literature helps the researcher to fill in the gaps and extend prior studies. It provides a framework for establishing the importance of the study as well as a benchmark for comparing the results of a study with other findings. It relates the study to the larger ongoing discourses of the literature related to the research topic. All or some of these reasons may be the foundation for writing the scholarly literature into a study.

The review of literature has at least three parts or sections: *First* section is Introduction section which defines or identifies the general topic, issue, or area of concern, thus providing an appropriate context for reviewing the literature. It also points out overall trends in what has been published about the topic; or conflicts in theory, methodology, evidence, and conclusions; or gaps in research and scholarship; or a single problem or new perspective of immediate interest. In this section the researcher tries to establish the researcher's point of view for reviewing the literature; explain the criteria to

be used in analyzing and comparing literature and the review sequence; and, when necessary, state why certain literature is or is not included.

While in the *second* section which is known as the body of the review, the researcher summarizes individual studies or articles with as much or as little detail as each merits according to its comparative importance in the literature, remembering that space (length) denotes significance. It narrates the research approaches, background of the authors, specific purpose or objectives of the study.

The *third* section is the conclusion, where the researcher summarizes the major contributions of the studies and articles to the body of knowledge. It questions whether the review research has added to the "state of the art" for the body of knowledge, pointing out major methodological flaws or gaps in research, inconsistencies in theory and findings, and areas or issues pertinent to future study.

Steps in Review of Literature

Before considering what literature to use in a research projectors, identify a topic to study and reflect on whether it is practical and useful to undertake the study. *Second*, describe the topic in a few words or in a short phrase. The topic becomes the central idea to learn about or to explore in a study. *Third*, make a credible list of literature to be reviewed. *Fourth*, use a format of taking the notes of the literature being reviewed. This includes the following:

- What are the purposes/objectives of the study?
- What methodologies are being followed by the study? (Your observations on the credibility of the method or methods being used).
- What theories/analytical framework are used by the researcher in analyzing the observations?
- What are the major observations/finding of the study?
- What are the broad conclusions being drawn?
- Do you agree with the observations/findings (if not why?)

Identification of major sources of literature

- i. Start with a recent book/research article/paper on a prime theme or topic related to research and identify the references being used in it and also scan the section on review of literature. A number of references could be traced by this.
- ii. Make a stock list of research materials through a search engine in the web on internet.

- iii. Discuss the topic with your research supervisor/ resource person and research librarian. They may also advise you.

Principles to be followed

Generally in undertaking review of literature a researcher follow three principles These are:

- i. *Principle of authority.* Is the researcher a reputed one with credibility and academic recognition?
- ii. *Principle of authenticity:* Is the research paper/report being published by a credible institution or publisher?
- iii. *Principle of relevance:* Is the research literature contextually and time wise relevant?

CHAPTER **4** **Research
Design**

CHAPTER 4

Research Design

Design in its simplest sense is a process of deliberate anticipation directed towards bringing an expected situation under control. Designing therefore refers to the process of making decisions before the actual situation comes in which decisions are to be made. For the management of any research, the researcher has to prepare his research design. Research design precisely means drawing a systematic approach and establishing a plan of action to carry out the research.

Meaning of Research Design

In carrying out a research project, a researcher has to plan ahead in a systematic manner. In fact, the researcher cannot hold all his decisions in his mind. He therefore, plans and records his decision using different systematic techniques, models and logical framework. Such symbolic construction of research action can be termed as Research Design. Based on a research design, the researcher plans his whole study and identifies the successive stages of his research. In summary, a research design is therefore, a plan of a proposed research work. Selltitz and his associates define a research design as "the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure" (Selltitz; 1965).

Research design explicitly defines the following components:

- a. The *subject* on which information will be gathered.
- b. The *type of information* required and its intended utilization,
- c. The *population* on which information will be gathered.
- d. The *methods* by which information will be gathered.
- e. The *means/organization* through which information will be gathered.

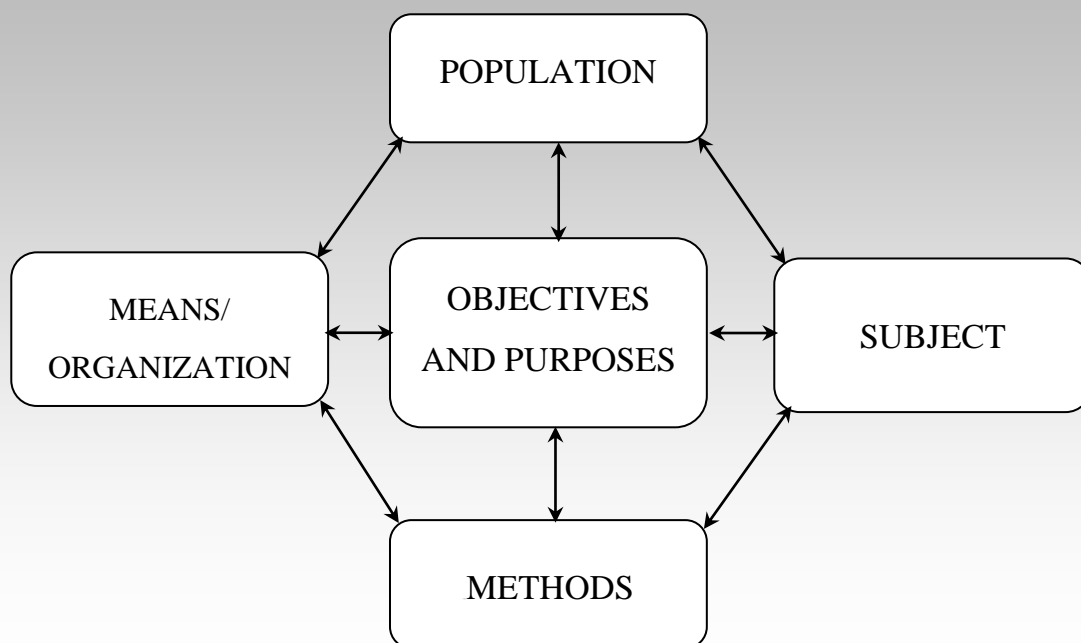
Following Figure III shows the components and logical links of research design.

A research design is based more or less on a well defined methodology. The research design should be developed only when the topic and problems and sub-problems of the research have been selected or identified, objectives have been properly outlined, operational definition of the explanatory variables are made, and hypotheses are framed.

A research design, therefore, provides the specific answers to the following questions (Young; 1967):

- a. What the study is all about?
- b. What type of data are required and what are the sources of data?
- c. What is the purpose? Its scope and importance.
- d. What should be the place or area of study?
- e. What should be the amount of material resources needed for the study?
- f. How much time is actually required?
- g. Which method of data collection would be appropriate?
- h. How would the data be analyzed?
- i. What would be the methodology of the study?
- j. What type of sampling would be utilized?

Figure 4.1: Components of Research Design



For practical purpose, research design is conceived of the following four components:

- i. *The sampling design*, which deals with the method of selecting the subject to be observed for the given study. It provides general information regarding the characteristics and size of the population, sample size and other relevant information regarding the parameters of the study;

- ii. *The observational design*, which relates to the conditions under which the observations are to be made. It describes the time, techniques and different conditionalities upon which the observations are to be made. It deals with the question of how many subjects are to be observed and how the observations are to be made and analyzed;
- iii. *The statistical design*, which identifies the statistical tools and technique.-, to be used in the processing and analysis of the empirical and quantitative data to be obtained under the study. It also sets the different test parameters and level of significance for different statistical tests; and
- iv. *The operational design*, which deals with the specific techniques by which the procedures specified in the sampling, statistical and observational designs can be carried out.

It must be remembered that none of these designs and the resultant models is independent. A decision in respect of any one phase of the design may influence or affect a decision in any other phase. Consequently, these phases generally overlap.

A research design is only a tentative plan. It differs on the research purpose. It may change as the study progresses, and as new facts, new ideas and conditions appear. Thus in social science, research design cannot be an inflexible paradigm. Research design for that matter, is not a highly specific plan to be followed without deviation, rather a series of guide posts to keep one headed in the right direction (Kearl;1976).

A methodologically drawn research design has the following advantages:

- i. A research design provides a clear and indicative guideline for steering the entire research.
- ii. It guides the researcher in deriving desired and meaningful observations and conclusions.
- iii. It checks the level of accuracy of the data and ensure validity of further statistical analysis.
- iv. It helps minimize the wastage of time, and beating about the bush and thereby ensures optimum efficiency and reliability.
- v. It minimizes the uncertainty, confusion and practical hazards associated with any given research problem.
- vi. It provides structured approaches for the collection of research materials and testing of hypothesis.

Research Question

Most social research originates from some general problem or question. So how do researchers come up with the idea for a research project? One of the most common sources of research ideas generate from the understanding and experience of practical problems in the field². One might, for instance, be interested in identifying the critical elements that perpetuate poverty in rural Bangladesh. Usually, such problem is broad enough that one could not hope to address it adequately in a single research study. Consequently, the researcher needs to narrow the problem down to a more specific *research question* that could be addressed. The research question is often stated in the context of some theory and or general understanding that has been-advanced to conceptualize the problem at hand. For instance, a research question might be: Does access to safety net program affect the incidences of poverty?

Every research work starts with a set of research questions. The entire research process is accordingly guided by these questions. The research questions derive from variety of sources, starting from the interest and inquisitiveness of the researcher, controversies or challenges generated from a profound social issue, and the overall policy orientation of a research substance. Research questions guide the researcher to formulate specific research objectives and the hypotheses of the study.

In the process of formulating the research questions, the researcher should keep in mind the following criteria:

- a. the research question should address an important aspect of the social problem;
- b. the research question should be do-able i.e., should be feasible given the expected study constraints;
- c. the research question should be timely in providing information that will be useful for current and future decision making;
- d. the research question should provide a synthesis of diverse view points so that the results represent an integration to the field, rather than simply addition; and,

² *It is to be noted that problem has some features to recognize. Some of the features of problem are: i. it is a deviation from standard: b. it tends to maintain a pattern and has regularity in its course, c. it has considerable social, political and economic costs, d. it must have at least a theoretical solution.*

- e. the research question should exhibit policy responsiveness by addressing issues in a manner that will help policy makers to act on the problem.

Hypothesis

Hypothesis is a projected statement subject to empirical test. It is a tentative generalization, the validity of which has got to be tested. A hypothesis is made in order to find out the correct and valid explanation of certain process or phenomena through scientific investigation. A valid hypothesis provides the basis of a theory.

Functions of Hypothesis

- i. The most important function of a hypothesis is to adequately explain all the facts connected with the hypothesis.
- ii. It enables us to direct inquiry along the right lines. It suggests experiments and observations. It helps to collect necessary evidence in order to discover the order of nature.
- iii. Hypothesis determines the method of verification as well as the procedure for inquiry. Hypothesis limits the scope of inquiry to a manageable area. Instead of random collection of data, it enables us to search only for relevant facts. Therefore, it leads to economy of time and money.
- iv. It leads to the discovery of laws. It explains facts and laws, and thus seeks to verify knowledge.
- v. Hypothesis leads to conclusion which is sometimes very significant for the advancement of knowledge. The significance of an object or event can be determined by a hypothesis.

Formulation of Hypothesis

The formulation of hypothesis presumes some problems for which inquiry is necessary. If there is no problem, no inquiry is needed, and there would be no necessity for a hypothesis. A satisfactory solution to any problem requires that the irrelevant facts be eliminated from the relevant facts. The formulation of hypothesis gives the direction in which the facts are to be arranged. We cannot go forward unless we begin with a suggested explanation of the phenomena. This suggested explanation is called hypothesis.

The hypothesis is the focal point of any research and must be so formulated that it can be tested and will permit the formulation of other

hypothesis. The following guidelines are offered for the formulation of testable and usable hypothesis.

Simple and Clear Concepts

Concepts used in the hypothesis should be clearly defined and easily communicated. This may not be an easy task, since a concept may contain vague and complex elements and have different meanings to different people. It would help to read published literature in which the concept has been used to discover the various ways in which the concept has been defined and to decide which definition best expresses one's idea. For example in the concept of "modern society" there are elements such as industrialization, anonymity in human relations, increased psychological pressures on the urban man, and many other elements. One then decides which of these elements he wishes to include as a part of his concept of modern society, thus redefining it to make it more specific. To make an idea more communicable and definite, it can be stated in terms of a set of directions. This is often referred to as the operational definition of a concept,

Ciopal (1963; 113) therefore proposes some important reminders for the researcher to bear in mind while using different concepts in social research:

- i. researcher should have absolute and complete understanding of the concepts that is being proposed;
- ii. researcher should understand the connotation and significance of the concept clearly, precisely and fully in the context of their usage;
- iii. if concepts are ambiguous, they must be illustrated; iv. vague and highly generalized concepts, such as 'function', 'modern society' 'socialization', etc. are to be translated into more concrete terms;
- v. concepts have to be understood in a wider perspective as to cover the related and outlying fields of the research.

Specific and Testable

The hypothesis must be specific and testable. Often the hypothesis is expressed in such general terms that it cannot be tested. A too general hypothesis can be further divided into more precise sub-hypothesis. It is not enough, for example, to predict increased contraceptive usage with industrialization. Precision is gained if indices of industrialization and contraception are carefully defined and the amount of increase, the time and the people affected by the prediction are specified. Making the hypothesis as definite and as specific as possible makes the research more manageable and the hypothesis more testable.

In line with Research Methods

Hypothesis should be formulated according to the availability of research methods. To be able to judge the researchability of problem, the researcher must know what techniques are available to test his hypothesis. If no appropriate techniques are available, the hypothesis cannot be tested.

The hypothesis should be related to existing theory

A piece of research is more likely to make a positive contribution to knowledge if it is based upon or is relevant to a body of existing theory. Science as cumulative in nature can not develop if individual studies in a particular field are independent of one another. A tested hypothesis should question, qualify or confirm one or more existing theories of social relations.

Empirically Verifiable

The most important condition of a valid hypothesis is that it should be empirically verifiable. A hypothesis should be compared with the facts of experience directly or indirectly. A hypothesis has ultimately got to be confirmed, otherwise it will remain as a mere supposition.

Operational Definition of Variable

Once the hypotheses are formulated in the light of the research questions, the researcher then needs to operationalize the malleable variables proposed in the hypothesis. Operationalization of variables simply means defining the variables in terms of specific measurable indicators. For every variable that must be operationalized, the researcher should first precisely define that variable, second, select specific indicators for measuring the variable as defined. For example, in World Bank study on teachers training in developing countries (Husen, Sana & Noonam, 1978) the variable "extent of teacher's training" was operationalized as "a teacher's certification or level of competence as defined as determined by official recognized credentials" (1978; 11). From this definition, the following indicators were selected: number of years of schooling attained, possession of a teaching diploma, teaching experience, cognitive ability, and salary.

Although operationalizing variables seems to be a fairly straight forward process, in social research this process can be awfully difficult. First, the variables in many cases may not be directly measurable. The lack of measurability may be resulted due to several reasons: i. time constraints on the study (e.g., showing changes in economic stability may take decades rather than months); ii. conceptual nature of the variables and the extent of

the variable (e.g., "ethical standard" is not easily operationalized); iii. the political and social sensitivity of the variables (e.g., graft and corruption in civil service is such an example).

Second, there may be no single, universally accepted measure of the variable. For example, measuring poverty in cross cultural and economic setting is difficult. Some may measure poverty solely in terms of actual earned income. While others argue that poverty should be measured by adjusting the actual income from variety of non-income sources of well-being. Such sources might include net worth or human capital. Furthermore, the actual measurement used may be chosen for political reasons to keep numbers of poor low so as to politically rather than from nutritional standard (Girshik & Williamson; 1982).

The final difficulty with operationalizing variables in social research usually arise because of a complex array of different indicators are needed to measure a variable adequately. For example, the effectiveness of a local level health centre can be measured by a complex set of indicators, including staff morale, clientele satisfaction, community knowledge and support for the centre, i improvement of community health, and the cost efficiency with which services are delivered.

Problems of operationalizing the variables can be dealt with several options. For variables that are not directly measurable, the researchers should consider the use of proxy or substitute indicators. Proxy indicators are the measures that reasonably substitute the desired concept. By definition, proxy indicators cannot provide a complete assessment of variables; nevertheless use of proxy indicators promotes some partial assessment of the phenomenon of interest.

Another way to overcome difficulties in operationalizing variables is to use multiple indicators for each concept (Campbell; 1969). The use of multiple indicators promotes research studies that are multidimensional in nature. Furthermore, multiple indicators allow for the examination of different types of effects attributable to causal factors. A study using only single indicator runs the risk of yielding little new insight by having only null relationships to report. Finally the use of multiple indicators has the additional advantage of allowing for the inclusion of indicators that are preferred by proponents of conflicting models of the social issues.

Model Building

One of the most used words in social science research today is model. In social science research particularly in economics, one can hardly think of a research without a model. From research perspective, model in its simple sense could be identified as a mathematical function that indicates the

logical structure and relationship of the variables. It indicates the degree and level of causal relationship, dependence and the direction of the variables. Models are therefore; used to understand, analyze any process or phenomena involving certain selected variables. Model portrays the dynamic association of contending variables interlocked in a chain of relationship.

However, model could also be viewed from non-econometric stand. Tyler has suggested a definition of model which appears to meet the need of administrative research. He writes, "when an area about which we already know a good deal is used to suggest laws for an area about which little is known, then the familiar area providing the form of the laws may be called a model for the new area" (Tyler; 1960:64).

Models are based on certain assumptions. Karl Deutsh (1951) proposed some of these assumptions as: i. that the world is knowable in general; ii. the model users assume that he can impose order on the phenomena under study; and iii models are culture bound and may not respond to different set of stimuli. An important part of the research process is the building of models to represent cause, effect and other relations. The term model basically refers to a dynamic framework or schema that helps portray the key concepts, propositions etc. of any theory.

Models may be highly conceptual or theoretical, developed at the start of" ;i piece of research, and then tested through the process of data gathering, analysis and reasoning. Models may also be the end products of research, with only a weak conceptual framework having been in existence at the start. Model building is now a sophisticated process, using computers and advanced statistical techniques. Social scientists doing research have been roundly criticized in the past for lack of clarity and understanding of the issues being addressed, simplistic analyses, narrow and poorly defined foci (Aaron;1978). To avoid such criticism, the first step in conceptualizing a systematic research work is the development of a preliminary model of the research problem. Such a model should generally delineate the definitions, assumptions, values, and presumed causes of the problem.

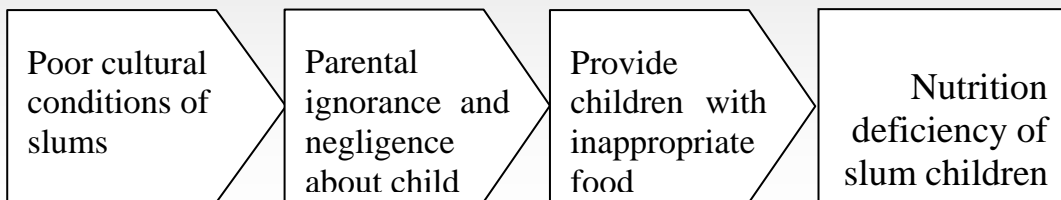
Following figure presents two simplified hypothetical models of research problems. In model A, nutrition problem of slum children are perceived to be a function of parental ignorance that can be altered by parent education programs and improvements in the poor cultural climate of the slums. In contrast, model B proposes that the nutritional deficiency of slum children is a function of the poor economic conditions of the parents. If model A were used for the study the types of research questions tested in the study would have been very different than if model B were used. Therefore, the model of the social problem to be followed must be specified

Figure 4.2: Example Models of a Hypothetical Problem Model A

General Theme : Nutrition of slum children
Problem : Nutrition level of the slum children below that of non slum children.

Causes : Parental negligence and ignorance

Model :



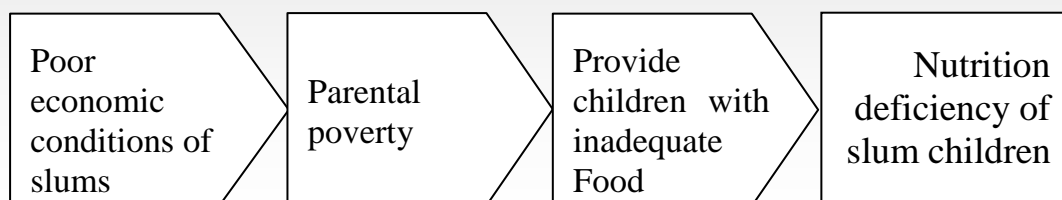
- Values and Assumptions**
- *Parental negligence is a function of slum environment*
 - *Parents can be taught about children's nutritional needs;*
 - *Parental concern about children's nutritional needs can be enhanced.*

Figure 4.3: Example Models of a Hypothetical Problem Model B

General Theme : Nutrition of slum children
Problem : Nutrition level of the slum children below a dietary standard.

Causes : Parental poverty

Model :



- Values and Assumptions**
- *If parents were financially able, they would meet children's nutritional needs.*
 - *Economic conditions of the slums must be improved in order to reduce children's nutritional deficiencies.*

as the first step in conceptualizing the research study prior to formulating the research questions.

In constructing a model for a given problem situation, following actions are to be taken;

- i. to single out certain elements as being relevant to the problem under consideration;
- ii. to clearly establish the significant relationships among these elements; and
- iii. to formulate hypotheses regarding the nature of these relationships.

Models can be classified broadly into two types: *quantitative* and *qualitative*. A *quantitative* model is a mathematical model defined by a precise set of assumptions expressible in terms of well defined set of mathematical relationships. These might be equations or other analytical expressions or instructions for a computer. The behavior of such a model is determined completely by the assumptions, and the conclusions are derived as the logic-ill consequences of these assumptions without recourse to judgment or intuition about the real world process or problem being modeled.

A *qualitative* model is typically based on less precise assumptions than are required for a quantitative model and its behavior may be described by a combination of deductions from these assumptions and by further subjective judgment about the process or problem being modeled.

Theoretical Framework

One of the main functions of theory is to provide explanation of processes and to predict possible movement of certain variable. Theories also explain the causal and natural relationship of variables. Since social problems and issues are very complex and interrelated by nature, it is not always possible to give a comprehensive and satisfactory analysis of an observed phenomenon. In order to explain any process or interaction, social scientists usually develop an analytical framework by combining some established theories in to an integrated framework of analysis- which in research parlance is called *theoretical framework*.

Theoretical framework refers to such logical arrangement or format that is derived, deduced from already established theories to probe, explain, interpret, and analyze any social process, problem or phenomena. A theoretical framework also provides the structure of logical reasoning, philosophical guidelines and mode of analysis.

Typical Format of a Research Proposal

When a research design is submitted in a proposal form either to an academic institution or a sponsoring agency following format is generally used.

i. Identification of the problem.

- Statement of the problem.
- Illustration of the problem, statement of sub-problem(s).

ii. Significance of the Problem

- Is the problem related to national issues/interest?
- Is it related to the broad field of knowledge?

iii. Review of literature related to the topic/problem

- Identify the core issue/problem that have been researched.
- Highlight the general limitations of the studies reviewed.

iv. Identification of objectives

- Identify specific objectives.
- Identify the assumptions.

v. Illustration of Theoretical/Conceptual framework.

- Framing the Hypothesis/Hypotheses/Models
- Operational definition of variables/concepts.
- What model is to be tested?
- Major Assumptions associated with the model,

vi. Methodology:

- What methods are to be used?
- Rationale of using such methods.
- What would be the sample design?
- What instruments will be used for data gathering?

vii. Analysis Plan

- How the data will be analyzed?
- What quantitative/qualitative tools will be utilized?
- Will there be an expert consultation - If so, who are the experts?
- What would be the nature of consultation?

viii. Resource and time Schedule

- How much material resources are needed?
- How much intellectual support is wanted?
- What time schedule will be followed?

CHAPTER

5

Steps in
Social
Research

CHAPTER 5

Steps in Social Research

Social research is a systematic process of investigation which aims to draw broad generalization. It is normally guided by a pre-constructed analytical as well as theoretical framework. As an investigative process, social research follows a sequential step. Following is a brief illustration of the steps:

Identification and Formulation of the Research Problem

The topic for research may be based on a number of considerations. It may be based on some practical consideration or by some theoretical and intellectual interests. A research topic may very well be selected from the burning problems of the time. It may also be based on the special interest and the convenience of the researcher.

Society is a complex system and is composed of contending forces and factors. Although it maintains a dynamic equilibrium, but each society either developed or developing is characterized by numerous problems of varied types, nature and dimension. Such dynamism demand understanding, explanation and analysis.

Problems of social research are therefore everywhere. A conscious and critical observation of one's immediate surrounding exhibits a lot of researchable issues. Whatever arouses our interest, prompts our curiosity and raises questions for which as yet answers exist but where dispute arises as to their validity - that is a fertile ground for the discovering of a researchable problem.

Defining the problem is however the most critical task of a scientific inquiry. The problem has to be stated clearly and explicitly, so that it will be readily understandable to the users of the research. Identification of research problem begins with the questions like "What do I want to find out?" "What question needs to be answered by the research?" etc. Once the research problem is being identified, the researcher sets down the specific objectives of the investigation in the light of the identified research problem. Research problems need to be stated explicitly. At this stage, the researcher clears up the following questions: Why is there the need to answer the research questions being posed? Who will be using information, and for what purposes?

The purpose(s) of the research however will determine the kind and extent of information to be gathered in the inquiry.

Formulation of Research Problem

Once the topic for research is selected, it is followed by precise identification and operationalization of a specific problem. In research parlance, identification and specification of a research problem itself is as *good* as half accomplishment of a research, Merton (1968) has distinguished the following three main ingredients that help the researcher to operationalize the research problem:

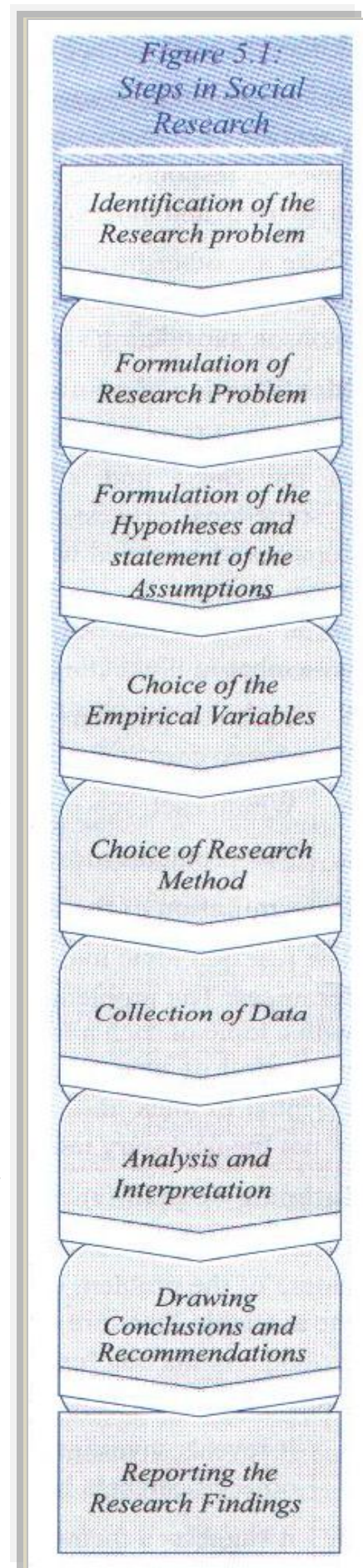
- i. Originating the question,
- ii. Rationale of the question,
- iii. Specifying the question.

The originating question is based on the fundamental object of the present research. That is to say, what is the specific problem which a researcher wants to solve or address?

It is also necessary to know the reasons behind the question that is raised. That is, why the question is being raised at all? If the question is answered, what will be the benefit?

The question should be decomposed into several specific questions, each of which can be answered separately with particular variable or set of data.

There is, however, a basic directive for the statement of problem "Always state the problem in a complete sentence with as great an economy of words as possible." Statement of problem should be so clear that anyone could understand it, react to it without the benefit of the presence of the researcher.



The research question has to be justified and its rationale has to be well accepted by the potential clients or users of the research. One cannot therefore propose wild ideas or sensational and mere catchy matters as research questions. Research question should be capable of answering straight forward answers to abject issues that need to be responded.

A situation may arise in which the selection of the research problem results from consultations and discussion among scholars of different social science disciplines.

Before any study starts, a series of discussions usually take place among these scientists on hypotheses, objectives, and research design, including areas to be covered, respondents, sampling design, method of data collection, instruments to be used, and other relevant matters.

There are other instances when the problem to be studied is not the choice of the researcher, but arises from the needs of some organization which acts as sponsor, subsidizing agency, or contracting agency for the research.

Identification of a Sub-Problem

Social problems are not isolated phenomena. These problems are the product of the cause and effect relationship of several social institutions and dysfunctional process. Most problems in their entirety are too large or too complex to be stated without sub-dividing them. Every problem can be broken down into smaller discrete unit. From research point of view these units are easier to comprehend and resolve. Following are the important points to remember in illustrating a sub-problem :

- a. Each sub-problem should be a complete researchable unit. A sub-problem should constitute a logical sub-area of the larger research undertaking;
- b. Within each sub-problem, interpretation of data must be apparent;
- c. Sub-problems must add up to the totality of the problem.

Determination of the Researchability of the Problem

The research topic must be such that it can be studied within the limits of ones' resources. The problem must be of manageable size. It would be futile to start with a topic of such a large scope that could not be properly investigated within the period of time allowed for the study, and with the funds. It is therefore, essential to think ahead and it should also be

determined beforehand whether or not the necessary information will be available to the investigators.

Intimate Acquaintance with the Research Problem

Efforts should be exerted to acquire a wide and deep understanding of the nature of the problem to be studied. This knowledge can be gained by reading the available literature on the topic, interviewing persons knowledgeable about it, and conducting exploratory studies. Also review of relevant literature generates several benefits like:

- a. it reveals investigations similar to the proposed study and show how the other researchers handled the research problem;
- b. it suggests a method of dealing with a problematic situation that may also suggest avenue of approach to the solution of similar difficulties;
- c. it reveals to the researcher the sources of data that the researcher may not have known existed;
- d. it can help the researcher to see his study in historical and associational perspective and in relation to earlier and more elemental approaches on the same problem; and
- c. it provides the researcher with new ideas and approaches that may not have occurred to him.

Formulation of Hypotheses and Statement of Assumptions

This is the most important phase of the research cycle. It is generally said that formulation of a good hypothesis is in effect half of the attainment of a research. The researcher formulates hypothesis in order to construct an assertion or proposition about an unknown phenomenon. The researcher attempts to establish a pattern of relationship of two or more variables, the validity of which is to be tested in the course of the research.

In the formulation of hypotheses certain assumptions have to be made. Assumptions are the statements which are taken to be true, without verification of the study in which it is made. Assumptions may be theoretically derived, or may be based on what are commonly accepted as facts or on the findings of previous research. Though they are not to be tested, there must be good reasons for making whatever assumptions are made. Given a set of assumptions, a hypothesis can be formulated by means of a functional relationship between variables which have been operationally defined. To translate a research question into a functional form like $Y = f(X_1, X_2, X_n)$ some analyses are needed. The dependent and

independent variables and the exact relationship between them have to be determined. The function can be just a simple direct or inverse relationship between variables like "when X increases, Y decreases" or it can be a causal relationship like "an increase in X by a certain amount produces an increase in Y by a corresponding amount". The functional relationship arrived at will suggest the data needed to test the hypothesis and hence the research method. One must decide with care, which available research method will adequately test the hypothesis as formulated.

Choice of the Empirical Variables

At this stage, the operational or working definitions of the variables to be used in the study should be established. In a study which seeks to establish the relationship between two or more variables, the dependent and independent variables, should be determined and stated. The variables involved in the study should be clearly identified and specifically defined with precise and measurable indicators.

Choice of Research Method

Researchers have a wide variety of choice to select an appropriate research method. Choice of a particular research method depends primarily on the nature of the research topic. It also depends on several other factors like (inn-, physical and financial resources, level of accuracy anticipated, degree of sampling error to be tolerated and the characteristics of the responds n population of the research. Each of the research method has its limitations and is not always comprehensive and self-contained. In order to ensure methodological soundness, the social science researchers therefore combine few methods together and devise an inclusive research style.

Collection of Data

It is the most important phase of a research. It could be done through administering different instruments, interviews, observations or any other technique found suitable. Careful and continued supervision is called for at this stage. Field data collector must know what to do at all times, and should have access to proper direction and advice in the event that they run into difficulties

Analysis and Interpretation

When the data and information are collected, the research goes for analysis and interpretation in the light of: a. objectives of the study; b. hypothesis of the study. At this stage, the researcher uses different types of statistical tests,

mathematical models as well as qualitative techniques to confirm and reject his hypothesis.

Drawing Conclusions and Recommendations

The conclusions may be a statement of the contribution of the research to further knowledge. In drawing the broad conclusions, the researcher is guided by the following questions: Are the results useful? If so, in what way can they be applied?

In the conclusion the researcher also makes suggestions for further investigations in the same field he has studied. The researcher also mentions the dimensions of the problem which he has not examined at length because of the limited scope of the study. Some related problems that seem to have been identified out of the study should also be mentioned. Modifications that should be introduced if one were to study the same problem again may also be mentioned. The general conclusion of the research should have the following features:

- i. conclusions should adequately be supported with empirical evidences and data;
- ii. substantiated by appropriate logical and theoretical explanation; and
- iii. consistent to the general theoretical and analytical framework of the study.

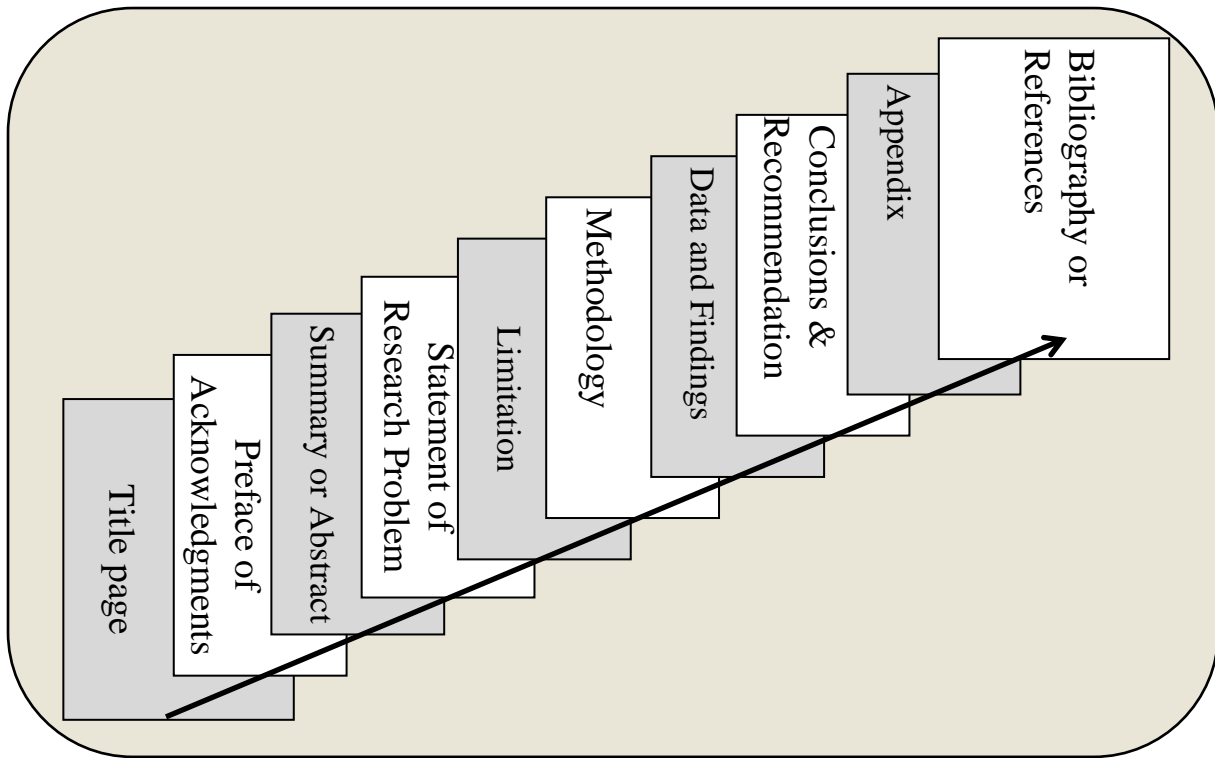
Before drawing the conclusions, it is also advisable to discuss the results of the analysis with experts or resource persons of the area of investigation. There is always the possibility that one has missed some facts or misunderstood others. Consultation may save one from the possible embarrassment of making unwanted conclusions.

Reporting the Research Findings

Research report should be written in an objective and straight forward manner, avoiding value judgments or clearly indicating them as such. Every statement made must be congruent with the research findings and other facts. (Generalizations must be qualified with data and information.

Following format should be followed while writing a research report:

Title page: This will contain the title of the study, the name of the study, the name of the writers, to whom the report is submitted, and the date of submission.



Preface or acknowledgments: This part of the report includes the explanation as to why the research was conducted, when it was done, where the investigations were made, and/or to whom the researcher is indebted for guidance and assistance.

Essentials of Social Research

Summary or abstract: This section presents a brief condensation of the entire work. No definite limit can be set to the summary but generally it should not be more than three to four pages in length.

Statement of the research problem and specific research objectives : This section elaborates the general statement of the problem and based on that presents the specific research objectives.

Limitations of the study : This section presents conditions and circumstances which prevented the study from being-as perfect as desired. It should mention the interrupting elements that appeared which may have influenced the results, as well as the unexplained or unanticipated factors.

Methodology: This gives a description of the materials used, the procedures followed, and the reasons why certain methods were chosen.

Data and findings : This section should therefore contain classified data (condensed into tables and charts) with their descriptions. Their analysis and interpretation should also be placed here. Computations, when they need to be shown, should be placed in the appendix.

Conclusions and recommendations : This section contains the broad observations and the overall conclusions drawn from the study. It also places specific recommendations in the light of the observations and conclusions.

Appendix: Those include here will be the raw data, questionnaires, schedules, list of documents, etc. One purpose of the appendix is to supply data which will make it easier for other researchers to evaluate and replicate the study.

Bibliography or references : This is a comprehensive list of all publications and unpublished research works pertaining to the study referred to or made use of.

CHAPTER

6

Sample Design

CHAPTER 6

Sample Design

The method of selecting a portion of the universe for study, with a view to drawing conclusion about the universe is known as sampling. In statistical point of view when only a part of the population or a group of units is taken into consideration, it is called sample method of inquiry. Sampling is therefore, the process of choosing a representative portion of a population. It contrasts especially with the process of complete enumeration, in which every member of the defined population is included.

Sampling theory allows us to select samples that are representative of the population under study and to understand how large the differences between the population and the sample are likely to be. How well the sample reflects the population of interest is called *generalizability* or *external validity* (Cook and Campbell, 1979).

When researchers design their studies, they are faced with how to ensure their work will accurately reflect the population in which they are interested. What is meant by population in research parlance? A *population* is the entire group of items or individuals of interest in a study. A population is a collection of people, objects etc. that share a common characteristic of interest. In sample surveys, two types of populations are widely discussed. The first one is the *Target population*, which is the population for which representative information is desired. Second, the *Sampling population* is the population from which a sample is drawn as determined by the sampling frame. *The frame* is merely a list of sampling units representing the population.

Often it is not feasible to study every member of a population, so researchers select a subgroup from the population, called a *sample*. If a researcher wants to examine the extent to which citizens of a country think men and women possess different aptitudes for mathematics and language, it would be very time-consuming and expensive to collect data on the viewpoints of all citizens. It is also likely that many citizens would be difficult to locate or may not want to participate in her research. Instead the researchers could select a subgroup of citizens, one that is representative of the population (i.e. the overall citizens) and collect data from them.

Suppose we want to conduct an attitude survey of households in Dhaka city, the subject to be the law and order problems in the city. The household is the *elementary unit* and the totality of all households in Dhaka is the *target*

Once a population is defined, a sampling frame can be created, which is the set of cases from which the sample will be chosen. In designing a sampling frame, researchers must consider how accurately it reflects the population.

One way to ensure this is to define the population very specifically so that the definition describing the population reflects who is actually sampled. Sampling frames are almost always inaccurate to some degree. A great deal of effort is spent on trying to get sampling frames to closely match the intended population and on learning what errors result from deviations between the sampling frame and the population.

Assumptions of Sampling

Soundness and compliance of the research findings to a great extent, depend on the rationality of the sample plan. Preparation of sample plan therefore, needs quite a good amount of desk works. Sampling as a process for selection of representative of the entire population, is based upon some assumptions:

- i. The units or samples selected must have likeness or similarity with other units to make the sampling more scientific.
- ii. The sample should be such that it can represent adequately the whole data.
- iii. Each unit should be free to be included in the sample
- iv. Absolute accuracy is not essential in the sample method. The results of the sampling method should be such that valid generalizations can be drawn.
- v. The maximum amount of information must be gathered as accurately as possible.

Utility of Sampling

These days, in social science research, sampling technique is widely used. It has occupied an important place in social research due to the following advantages:

- i. As a quantitative approach sampling helps researcher to identify various representative units of a population without being biased. With the help of this method, a large number of units can be scientifically selected and studied. Normally when all the units of a 'study population are homogeneous, sampling technique is very simple. As the population become heterogeneous, sample design gets complicated but ensures greater degree of accuracy. As a matter of fact, when cent percent accuracy is not required, the use of sampling technique becomes inevitable.
- ii. This method saves a lot of time, energy and money. Because of scientific selection of sampling unit, intensive study is possible through this method

- iii. When the data are unlimited, the use of this method is not only very useful but essentially unavoidable. Sample creates different frames and cluster, of the sources of data in accordance with selected research parameters.

Sample Size

Sample size to a great extent determines the ultimate fate of the findings and analysis of the research. At this stage one would naturally be questioning as how big should be the sample size.

As a matter of fact, the size of the sample depends upon a number of factors These are as follows:

- i. *Homogeneity or Heterogeneity.* If the population of universe is homogeneous, a small size of the sample may serve the purpose. But if the universe is heterogeneous, then the sample must be larger in size.
- ii. *Number of Classes.* If the number of classes is large, the sample should also be large enough, so that every class must be of proper size for statistical analysis. On the other hand, if the number of classes is small, the small-sized sample is well enough.
- iii. *Inertia of Large Numbers.* There is a mathematical logic : "Large aggregates are more stable than small." It means that the total change becomes very small when a large number of items are taken in a sample. This law presumes that the changes in the direction are neutralized by the changes in the opposite direction, and constancy is obtained. Hence, larger the sample, greater the accuracy.
- iv. *Law of Statistical Regularity.* This law indicates that the samples must be random and representative of the whole universe. Only then accurate results are obtained. Knowingly or unknowingly we make use of this law very frequently in our daily life.
- v. *Size of Questionnaire.* The size of the questionnaire or schedule plays a vital role on the size of the sample. If the questionnaire is small in size, the small-sized sample can serve the purpose. But if the schedule is large and the questions are difficult, the sample should be large in size.
- vi. *Nature of Sampling.* If the cases are geographically scattered, small sample is more suitable. If the selection of samples is done by the stratified sampling method, the reliability and accuracy can be obtained by small sized samples.

Determination of Sample Size

Four things must be known or decided upon before the required sample size can be determined. These are (Pillai, 1957:18):

- i. N, the total number of sampling units in the population;
- ii. d, the maximum error deemed acceptable;
- iii. Z, the normal variable. A normal variable is one that follows a bell shaped distribution called the normal distribution of Z corresponding the prescribed reliability. These values are obtained from Normal curve table as shown below:

Reliability in percentage	80%	90%	95%	100%
values	1.290	1.645	1.960	3.000

- iv. A precise knowledge of the variance. For the purpose of determining the sample size required, this must be estimated or guessed before the survey. There are four possible ways of doing this:
 - a. using the results of a pilot survey;
 - b. Using results of a previous survey on the same population;
 - c. By "guesswork" done after consultation with people knowledgeable about the population.
 - d. Taking the samples in two steps: step 1- taking a "small" mi to be used in estimating O² or P; step 2- determining the required sample size n₂ and take the necessary additional sample (n₂ less ni).

Example :

In making estimates of given characteristics of household size in certain village of 200 household, suppose it is desired that the estimated mean should not be more than one unit away from the true mean household size [for example if the true mean 6.0 than the estimated mean should be in between 5.0 to 7.0]. The

Formula:

$$n = \frac{N \cdot Z^2 \cdot S^2}{N \cdot d^2 \cdot Z^2 \cdot S^2}$$

Calculation

$$n = \frac{200 \cdot (1.645)^2 \cdot (9)}{200 + (1.645)^2 \cdot (9)}$$

$$n = 4870.845 / 2 - 24.3542 = 21.71051$$

n = 22 household.

value of variance is not known. However, some previous studies on rural household indicate that the variance is about 9.0. What should be the sample size in this case?

Parten (1965:312) has also offered a simple formula for calculating the size of sample.

Size of the Sample

$$n = \frac{\text{P.C.}(100 - \text{P.C.})Z^2}{T^2}$$

Where

P.C. = Preliminary estimates of the percentage (from the universe).

Z = The number of standard error units which are found to correspond to the required probability.

T = The margin of error which may be tolerated (5% or 2%).

Types of Sampling

The main types of sampling generally used in social science research are (a) Random sampling (b) Stratified sampling (c) Purposive sampling (d) Multi-state sampling (e) Convenience sampling, (f) Self selected sampling.

Random Sampling

When every member of a population is given an equal chance of being included in the sample, this is a *random sample*. Random sampling is generally used when the population is not widely spread over vast geographical area and more or less homogenous with respect to the characteristics under study. Random sampling is a process of selecting a sample or sub-set of all sample units, giving each sample unit in the frame an equal chance of being included in the sample. In random sampling, individuals are selected from the population in such a manner as to allow every individual of the population the same chance of being selected. When sample of size n is truly random, all samples of that size have the same chance of being selected. Random sampling is made by several methods of which few are as follows :

The first method is Lottery method. In this method, the names of the individuals or units are written on slips of paper and they are put into a box. Then, the slips of paper are mixed thoroughly and some slips are picked up

from the box. These papers are taken up for sampling. The second method is The third Numbers. In this method the researcher prepares a list of 10400 four digit numbers written at random at every page. On the basis of these numbers, (election of samples become very easy. The third method is known as The Grid system. In this method a map of the entire area is drawn, then a screen with squares is placed on the map and some of the squares are selected at random. The areas falling within the selected squares are chosen as samples. This method is generally used for selecting a sample of an area. The fourth method is selection from Sequential List. In this method , the names of the units are arranged in numerical, geographical or alphabetical order. Then out of the list any number is taken up.

Advantages and Disadvantages of Random Sampling

Advantages : The major advantage of random sampling is that the theory involved in this type of sampling is simple. It is easier to understand than the theory behind other sampling designs. Estimation of methods are simple and easy.

Disadvantages : There are three principal disadvantages of random sampling to be reckoned with:

- a. In cases where the population variability is very sporadic and irregular, random sampling cannot be sorted to, because it is less precise than other designs.
- b. The sample selection which requires the listing of, and assigning of numbers to all sampling units will be quite impractical in some cases.
- c. With random sampling, there can be a problem regarding data collection by reason of geographical considerations. Selecting and interviewing a random sample of farmers through out the whole country, for instance might be very difficult.
- d. The sample may not be truly typical of the population.

Stratified Sampling

Stratified sampling is normally used when the population is such that the distribution of characteristics under consideration is very sporadic or concentrated in small, scattered points of the population. It is also used where precise estimates are desired for certain parts of population. There are cases wherein the population is made up of items that are heterogeneous with respect to the characteristic(s) under study. In such a situation, the

population is divided or stratified, into more or less homogenous sub-populations (strata) before sampling is done.

In this system of sampling, the universe is divided into a number of groups or strata. Then certain number of items are taken from each group on random basis. Construction of group or strata is made with following points in mind:

- a. there should be perfect homogeneity in the different units of strata;
- b. stratification must be clear, well defined and free from overlapping;
- c. different variables involved in the study should be taken in to account;
- d. the size of stratified sample must be too small.

Stratified sampling can be divided into three main parts — a. Proportionately stratified; b. disproportionately stratified; and c. weighted stratified sampling.

Proportionately Stratified Sampling : By this method, the number of units are drawn from each group or strata in the same proportion as they are in the universe.

Disproportionate Stratified Sampling: In this method, inter strata comparison is possible. Under this sampling pattern, the number of elements drawn from the strata is independent of the size of these strata.

Weighted Stratified Sampling : In this method, equal number of items are selected from each group and thereby averages are drawn from each stratum. After doing this they are given weights according to the size of the stratum in the whole stratum of the universe.

Advantages and Disadvantages of Stratified Sampling:

Advantages: There are three major reasons favoring the use of stratified sampling:

- a. It is more efficient than the random sampling;
- b. It allows for more comprehensive data analysis, since information may be provided for each stratum or sub-population; and
- c. It is administratively convenient.

Disadvantages : There are two counter-considerations, however;

- a. The stratification of the population may mean the need for additional prior information about the population and its sub-populations; and
- b. A separate frame is needed for each stratum.

Systematic Sampling

There are many situations in which the most practical way of sampling is to select every k th unit from an ordered population, the first unit being selected at random. Here, k is called the sampling interval; the reciprocal $1/k$ is the sampling fraction.

For example every 20th name of a list, every 50th piece coming off an assembly line and so on.

Systematic sampling is used in those cases where the ordering of the population is essentially random and where there is a population (Figure (6:1))

Advantages and Disadvantages of systematic sampling:

Systematic sampling has two principal advantages:

- a. Selection of sample is administratively easier, quicker than Simple random sampling; and
- b. It is possible to select a sample in field without a sampling frame.
- c. Systematic sampling is especially appropriate if:
 - i. a researcher wishes to spread the sample over the population particularly where the population is scattered over a large geographically, contiguous area; or

Figure 6.1 practice example-Sample

Suppose we want to estimate the average number of owner-occupied households units per para in a given village of $N = 55$ paras. With the map of the Village, para can be identified, a systematic sample from the map can be chosen. A list of the paras in the village in order of location is to be made. Suppose we want to choose 6 paras out of 24. The sampling fraction is $6/24$. and the sampling interval is 4. Following steps will be then followed to make the sample plan work:

- a. Paras to be numbered consecutively from 1 to 24 in the frame.*
- b. A number at random between 1 and 24 is selected.*
- c. Assuming the number is 6.*
- d. From the block the para numbered 6 will be used as anchor number and every fourth para will be chosen.*

- ii. the researcher wishes to draw from a file, particularly, if the file is in chronological order.

Disadvantages: This type of sampling has two major disadvantages:

- a. If the population is not in random order, it is not possible to validly estimate from the sample;
- b. If periodic regularities are found in the list, a systematic sampling of population may consist only of similar types.

Cluster Sampling

Cluster sampling is a method of selecting a sample of distinct groups or clusters, of smaller units called elements. The sample cluster may be chosen by random sampling or by systematic sampling with a random start. Similar to strata in stratified sampling, clusters are mutually exclusive sub-populations which together comprise the entire population. Cluster sampling is especially appropriate when a satisfactory list of elements in a population is not available or lower field cost is more important than precision.

Advantages and disadvantages of Cluster sampling

The major advantages of cluster sampling are two :

- a. There is no need to construct a list of elements in the population as one must do in random or stratified sampling the frame for cluster sampling is simply a list of the clusters;
- b. even if a list of elements were available, cluster sample would still be cheaper, because field cost would be minimized by the elements being physically closer together than elements selected by random or stratified sampling.

Disadvantages : Cluster sampling is not so efficient as random or stratified sampling are. Estimates based on cluster sample are generally not as reliable as estimated drawn from random or stratified sampling. There are more reports of poor representativeness and sampling error in this method.

Purposive Sampling

In this method, certain units are selected purposively for judgment by the researchers. In this selection, the researchers try to make the selection as representative. The investigator selects the relevant and representative samples as far as possible. The investigator also ensures that the frequency

and the distribution of the sample are similar. However, if this method is seriously followed a small sample may even become highly representative.

Quota Sampling

In this system of sampling, quotas are set up according to some specified characteristics such as so many in each of several income groups, so many in each age groups etc within the quotas, the selection of sampling units depends upon the personal judgment of the researcher.

Multi-stage Sampling

In this method, items are selected in different stages at random. In multi-stage sampling the selection of the sample is accomplished in two or more steps. The population is first divided into a number of first-stage units from which a sample is drawn. If one desires, he might add further stages, dividing the population into an hierarchy of sampling units corresponding to the different sampling stages. However, this method of sampling can only be used where the universe is very large. This method, in other words, is a combination of random and stratified sampling. Multi-stage sampling is appropriate where the population is scattered over a wide geographical area and no frame or list is available for sampling.

Advantages and Disadvantages of Multi-stage sampling

Advantages: Multi-stage sampling has three major advantages, namely:

- a. It is more efficient and flexible than single stage sampling*,
- b. except for the first stage units, a sampling frame is required for those units selected in order to sample the sub units; and
- c. transportation costs are greatly reduced especially when first stage units are geographically distant from one other.

Disadvantages: The major disadvantage of multi-stage sampling is its complexity in theory, which may be difficult for non statisticians to follow. Estimation procedures are difficult, especially when the first stage units are not of the same size. The sampling procedure takes much time at the planning stage.

Snowball Sampling

This sampling is used when people in a group of interest inform the researcher about other individuals in that population who could also fit the criteria for inclusion in a study. Researchers form their sample by identifying a few individuals and then asking each person to give names of

others they know. This approach is particularly useful for contacting difficult to reach groups. Suppose we are interested in learning about underground economy or black money and its potential of formal investment. Since accumulation of black money is illegal and there is no formal list of persons having black money from which to select a sample. Thus the researcher may decide to identify a handful of potential respondents for participation and then ask each of them to give some names of other persons they know and perhaps even ask their help in to interview them. Snowball sampling can be a form of network sampling.

Convenience Sampling

In this sampling method, researcher chooses items in accordance with his own convenience. It needs no prior planning for selecting items. This method is applicable in those cases where the universe is not well defined and the sampling unit is not clear and also where a complete source list is missing.

Self-selected Sampling

In this method, the investigator does not select samples but the sample offers them for selection. This method is applicable in such case where tin-sampling area and sample unit are not fixed.

Extreme Case Sampling

Extreme case sampling is the selection of unusual cases that fall outside general patterns. These extreme cases may be very interesting theoretically even though they are by definition not representative of the population.

Choice of Sampling Techniques

The choice of technique for getting a sample depends primarily on the nature of the problem, the cost and time factors involved, and the desired level of precision or reliability of the results. There is no single principle which would lead the investigator to choose a particular sample scheme to the exclusion of others. His choice is modified by the availability of resources and materials, and by certain statistical and administrative consideration.

In many instances, the research problem under consideration by its very nature along with the objectives pursued, automatically eliminates one or several possible sampling schemes. The researcher must then weigh the

advantages and disadvantages of the remaining techniques and chose that one which would best meet his budget, time, and precision requirements.

Considering the varied sampling options, a researcher should adopt a single technique or a suitable combination of techniques in setting the sampling design that best meet the desired research goal. In choosing the sampling plan, a number of questions, then, should be answered: a. What sampling frame or list is available? b. How big a sample is desirable? c. What sampling procedure is to be used? d. Are the resources available (financial, material, human) for the research sufficient to meet the requirements of the sampling plan?

CHAPTER **7** **Mode
of Data
Collection**

CHAPTER 7

Mode of Data Collection

Data and information for social research are scattered all around. Data need to be conscientiously identified, carefully selected and methodically collected. Validity and objectivity of research to a great extent depend on as to how data have been gathered.

In actual practice there are different methods of data collection. However, there are four leading methods of data collection that are widely used in social research. These are:

- i. Survey of documents and other secondary sources;
- ii. Observations;
- iii. Questionnaires; and
- iv. Structured schedule.

Selection of a method or methods will depend on the objectives of the study. To select a particular method, the researcher has to consider a number of things like the scope of the study, types of information needed, and the degree of accuracy required and the budgetary support of the research project as well as other resource constraints.

Survey of Documents

Documentary source is one of the most important sources in social science research. Documentary sources include published and or unpublished materials, books, journals, reports, documents and so on containing important data for research. The data may also be collected from unpublished articles, reports, books. These are generally known as secondary or indirect data.

Document schedules are used for recording data from case histories, documents, official records. Tabulations are made from these schedules either manually or mechanically.

Followings are the main sources of documentation (Ghosh; 1983).

Books

Books are the store house of basic and applied knowledge. Books enlighten the researchers with not only on the theoretical aspect of the problem, but also on the empirical evidence. In order to grasp the research issues thoroughly and meticulously, the researcher has to acquaint himself with the recent and leading books on the relevant field of his study. The researcher

has to consult the contemporary literature on the problem so as to familiarize himself with the postulated theories and the available empirical evidence. By thorough review of current literature the researcher gathers counter arguments and thus sharpen his logical framework.

Published Official Data

Different research and public and or private institutions almost regularly publish data and information in their area of specialization and interest. There are several reputed national and international organizations those not only publish data but also disseminate these information regularly to the interested users.

Survey Reports

It is one of the most widely used sources of data. Different research organizations both government and non- government occasionally publish the findings of the various surveys undertaken by them. These reports are the attractive sources of empirical data. In formulating hypothesis and the theoretical framework, social researchers, these days depend considerably on such survey data. However, the researcher has to examine the time frame of the study, authenticity of the data sources and the degree of reliability before using such data for further formulation of problem and analysis of his own research.

Memoires

Leading social personalities themselves are the valuable sources of research data. Personal documents like, memoires, autobiographies and diaries and various correspondences of such important personalities constitute very rich sources of research data for further analysis and reference.

Travelogues

These are the written accounts of the experiences and observations drawn by the travelers. The travelogues usually contemplate the personal views and opinion of the narrator reflecting upon the socio-economic, political or cultural life of the people met along their courses of the visit. Such narrative statement provides historical account and references for social research.

History

History does not only narrate the past but also objectively examines the social events and phenomena of the bygone days. As present stands on the past, historical accounts of a phenomenon or system or institution is therefore are precious documentary evidence for social research. Social

phenomena are mostly evolutionary and integrated. History as the objective account of the past, therefore, helps in analyzing particular current phenomena in the light of the evolutionary trend of the occurrence.

Interview

This method is most commonly used in social science research. A well structured interview is much more effective than an "oral questionnaire." Many types of information and even data can be procured by face-to-face contacts with people, especially data related to personal history, opinions and attitudes.

It is a verbal technique for obtaining data direct from the primary source. Interview is a very systematic method by which a person enters deeply into the life of even a stranger and can bring out needed information and data for the research purpose.

From a strict structural point of view we can identify two types of interview : a. Structured Interview; b. Unstructured interview.

Structured and unstructured interview are differentiated on the basis of the type of structures used by the interviewer. A structure is one on which a similar stimulus is given to all respondents; unstructured interview tends to result in different stimuli being given to different respondents.

Structured Interview

Such interviews involve the use of a set of pre-determined questions and of highly standardized techniques of recording. The reason for standardization is to ensure that all respondents reply to the same questions that is, any given question has the same meaning for all the respondents. Structured interviews mostly involve the use of fixed, alternative questions. Structured interview may also involve the use of open ended questions. But the questions and their order are pre-determined.

Unstructured Interview

Unstructured interviews, as opposed to the structured ones, are characterized by a far too greater flexibility of approach to questioning the respondents. Compared to the structured interviews, the non-structured ones, involve relatively much lesser standardization of relevant techniques and operations. Consequently, the investigator is never certain as to what the respondents will give out as information.

Interviewers in this type of interview do not follow a list of pre-determined questions. Respondents are encouraged to relate freely and frankly their

concrete experiences with little or no direction from the interviewer. The respondents are allowed the freedom to talk on whatever events seem significant to them, provide their own definitions of the social situation, report their own focus of attention and reveal their attitudes and opinions as they deem fit.

Checklist of Interview Session

Following is the standard checklist for conducting an interview session (Doby; ' 1954:207):

- ✓ An interviewer generally should open an interview by asking factual non threatening questions.
- ✓ The interviewer should locate the major data by unstructured "lead" question.
- ✓ The interviewer should make use of occasional guide questions.
- ✓ The interviewer should make an effort to pick up leads.
- ✓ The interviewer should cut through generalities with well formulated probes.
- ✓ The interviewer should stick with the fruitful areas with once they open up.
- ✓ The interviewer should reflect on the meaning of the emerging data and ask questions that clarify or amplify their meaning for the research problem.
- ✓ The interviewer should be specially alert to follow up only areas where the respondent shows emotional involvement.
- ✓ The interviewer should try to redirect the interview to more fruitful topics when useful data are not emerging.
- ✓ The interviewer should be alert to "touchy" subject matters.
- ✓ The interviewer should wind up the interview before the respondent becomes tired.

Common Errors in Interview Method

Although interview method has been used quite frequently, there are some in built limitations of the method. It has been noticed that in most cases, the researcher does not adequately plan the interview or develop a detailed interview guide. In some cases it is seen as more of a person to person discussion and the researcher does not conduct sufficient practice interviews. Sometimes the researchers fail to establish safeguards against

the interviewer's biasness. It is also quite difficult to cross check the information that is provided by the respondent. Due to practical limitations the researcher also in many cases does not make provisions for calculating the reliability of his interview data.

Language plays an important role in the interview sessions. Use of local and colloquial language in the interview inhibits the spontaneity of the respondents. Moreover, the researcher may ask for information that the respondent cannot be expected to have.

Observation

Observation means examining or scrutinizing something with definite purpose. It is a method whereby the knowledge and understandings are drawn through the use of sense organs. Observation method of data/information collection is traditionally used by the anthropologists and the sociologists. Observation method consists of collecting the facts which are in the direct knowledge of research. Observation method is concerned with neither what a respondent places on paper nor with what he says in an interview, but deals with the overt behavior of persons in appropriate situations, sometimes under conditions of normal living and other times within specially set of determinant factors conditioning the environment (Good: 1952:222).

Observation method is a basic to all research in particular, where there are no records, oral or written documents of any sort, thereby necessitating the development of benchmark studies. It is also applicable in cases where the population or subject groups have a low rate of literacy or more or less are illiterate. Observation method is extremely effective where the researcher is particularly interested in a whole cycle of activities pertaining to the culture of the people under observation.

Observation method of data collection can be classified into two: (a) Participant observation (b) Non-participant observation.

Participant Observation

This method of data collection is extremely difficult and time consuming but very effective. Through this method the researchers become a part of the observation population or the subject. The researcher collects qualitative material by actually taking part in whatever activities, way of life, of the observed population, he is interested in. Before the immersion to the observed population the researcher clearly sets the parameters and indicators of his study, and consequently is better able to extract from

diverse phenomena he observes. In course of time the researcher modifies his observation techniques so as to enable to tap altogether the other activities which were not perceived.

Morris Schwartz (1955:343) notes participant observation as:

The process and the kinds of data are influenced by continuing observed-observer transactions. The role of the observer may be passive or active. In either case effective involvement with the observed develops inevitably and may range from sympathetic Identification to projective distortion. The form it takes is n Jinn-lion primarily of the observer's experience, awareness and personality.

The participant observer usually does his recording or note taking only when he is alone or back at his base or residence. In a majority of cases he will live in the community long enough to observe the whole cycle of its activities.

Participant observation is a formal means of obtaining data in anthropological research. Its obvious advantage is that researchers can actually watch and record what people do, not just what they say (Kearl; 1976).

Non-participant observation

Non-participant observation requires that the researcher finds a way of being separate from the action while he observes. Many social scientists use this information or indirect way of collecting data. During the non-participant observation stage, the researcher can take notes or only observe and record later on.

In any observation technique, the observer should try to be in as low-profile as possible. If he becomes an over intruding element, the reliability of the observed data will be affected. In fact, he should be aware that whether he is intrusive or not.

Common Error in Observation Methods

As a data collection technique observation method has some difficulties and identified limitations. It has been noticed that in many cases the researchers are not adequately trained to adjust with the observation conditions and thereby only collect face value information and unreliable data. It is also very difficult for the researchers to accustom themselves with the conditions prevailing in the observation unit. Too much enthusiasm of the researchers sometimes disturb the normal activities of the observed population and result in an artificial or pretentious behavior on the part of the

population under observation. Sometimes the researchers fail to take adequate safeguards against the observer, disturbing or changing the situation that is being observed. Attempts to evaluate behavior that occur so infrequently that reliable data cannot be obtained through observations (Kearl; 1976).

The researchers have identified several factors that affect the reliability of observation. Following are the factors that usually cause the poor reliability of data gathered by observation methods.

- Inadequate sampling;
- Lack of precision in defining behavior;
- Complexity of method of recording;
- Rapid, complex interactions;
- Difference in perspective;
- Individual differences in degree of decisiveness of activities of subject observed;
- Constant errors due to observer's bias;
- Requiring high order inferences in classifying behavior;
- Demanding the simultaneous observation of too many variables;
- Excessively long period of observation without interspersed test period;
- Inadequate training of observers;
- The effect of individual observer upon the behavior of the subjects; and
- Degree of acquaintance with the subjects.

Questionnaire

A questionnaire is a very effective instrument that facilitates in collecting data from large, diverse and widely scattered groups of people. Questionnaire is used to gather objective, quantitative data as well as accruing information of qualitative nature. It is an instrument to collect and aggregate the primary data from the basic sources.

Questionnaire is an information blank that is used to collect data from the primary sources. A questionnaire consists of a number of questions arranged in a precise logical order with a definite purpose. Normally a questionnaire is mailed to the respondents and is filled in privately without the presence of the researchers or the enumerators.

Type of questionnaire

Questionnaire can be broadly classified into two types; a. Structured b. Non-structured.

Structured Questionnaire

A structured questionnaire contains definite, concrete and pre-ordained questions. This type of questionnaire is prepared in advance and not on the spot during the questioning period. The structured questionnaires are used in a wide range of research projects. Through the structured questionnaire the researcher can exactly set his study variable and collect the quantitative and or qualitative data in the light of the hypothesis of the study.

Non-Structured Questionnaire

During the time of interview, a non-structured questionnaire is used as a guide. In this method, the interviewer has the liberty to arrange the form and timing of his enquiries. One of the merits of this method is its flexibility which is very essential for conducting any research query. This method is widely practiced in studying family group cohesiveness, personal experiences, attitudes, beliefs and related matters.

Questionnaire is also divided into different types on the basis of nature of the question. These are a. Open b. Closed, and c. Mixed.

Open ended questionnaire

The Open ended questionnaire is used in case where new facts are to be searched out. This method is mainly used for intensive studies. The respondents are free to express their views and ideas. The question is put in such a manner that it does not limit the choice of expression.

Closed questionnaire

The Closed questionnaire is used when categorized data is wanted. In this case, the respondents choose the answer from a set of provided responses or options. He has no liberty to express his own judgment but to respond in the light of the given categories.

Mixed questionnaire

The Mixed questionnaire consists of both close and open type of questions. In fact, in social science research this type of questionnaire is most commonly used.

Questionnaire method is very much useful when the respondents are relatively educated. Importance and significance of the problem under study

also affects the response of a questionnaire survey. If the respondents are strongly in favor or against the concerned problem, a higher response is expected. Again if the get up of the questionnaire is attractive and the size is small - people feel interested and easy in responding the questions. Sometimes of course, monetary incentives also play a vital role in getting high response.

Principles of Questionnaire formulation

The accomplishment of the research objectives depend largely on the nature of the data collected in the light of the research question. Authenticity and validity of data is therefore important. Questionnaire as an instrument of primary data collection is of much importance in social research. In preparing a questionnaire the researchers should be guided by some principles (Scales, and Yeomans; 1950:2):

- The questionnaire should start with a catchy and lucid heading indicating the objective and nature of the study.
- It must be short enough so as not to take too much time and so that the respondent will not reject it completely.
- It must be of sufficient interest and have enough face appeal so that the respondent will be inclined to respond to it and to complete it.
- Necessary instructions regarding filling up the form must be given.
- Language of the questionnaire should be easy, understandable, clear and self explanatory. Questions should be capable of being answered without prejudice.
- The questionnaire should obtain some depth on the response in order to avoid superficial replies.
- The ideal questionnaire should not be too suggestive or un-stimulating particularly with reference to choices.
- Questionnaire should be reasonable in size and should preferably be short and each question must focus on one particular issue.
- Limited number of questions should be asked and only essential questions be incorporated.
- Questions must be well organized and sequential.
- Embarrassing, very personal or emotional questions should be avoided. Questions must be asked in such a way that the responses will not be embarrassing to the individual.

- Questions should be asked in such a manner as to ally suspicion on the part of the respondent concerning hidden purposes in the questionnaire.
- The responses to the questionnaire must be valid and the entire body of data taken as a whole must answer the basic question for which the questionnaire was designed.
- Question should elicit responses that are definite but not mechanically forced.
- Answers to the question should be corroborative in nature.
- Answer to the question should be objective and capable of tabulation.
- Questions should be presented in a well ordered sequence.
- Leading and prompting questions should be avoided.
- Professional words, jargons, technical terms must be avoided in a questionnaire.

In administering a questionnaire following other principles should also be taken care of:

- Each questionnaire should clearly explain the purposes of the research work and elucidate how the respondent would tend to be benefiting from such a study.
- For the respondents' convenience in returning the questionnaire an addressed and stamped envelope should be attached with the questionnaire.
- In the covering letter or somewhere in first page of the body of the questionnaire, the respondent should be assured that all his answers will be kept as strictly as confidential and in no way such information or data will be shared with anyone. The forwarding note should also clearly give a brief account of the social utility and significance of the proposed research.
- Questionnaire should also provide necessary instructions to the respondents. It should clearly indicate the time by when the questionnaire has to be returned, units of measurement used, if there are multiple choices or scales are used then adequate illustration should also be given.

Pre-testing of a questionnaire

Before administering a questionnaire it is more or less obligatory to test the validity and the applicability of the questionnaire. It is desirable to

undertake a preliminary test on a sample or pilot basis. Followings are the specific advantages of undertaking a pretesting of a questionnaire.

- It gives a clear understanding to the researcher whether the questions asked are understood and accepted by the respondent.
- The researcher can identify the major weaknesses of the questionnaire.
- It helps forming ideas about the rate and response or non response likely to take place.

Limitation of Questionnaire Survey

When the research problem is not operationally very well defined and the background of the respondent population of the study is not sufficiently known it becomes quite difficult to prepare a standard questionnaire. Researchers sometimes use a questionnaire in dealing with research problems that could have been better studied with other research techniques.

Sometimes researchers give insufficient attention to the development of the questionnaire. In some cases due to time and other resource limitations the researchers do not undertake the pretest of the questionnaire before the actual administration of the instrument.

There is a tendency among some researchers to ask too many questions. This makes unreasonable demands on the respondent's time and affects the quality of the data that have been generated by the instrument.

The researchers in many cases are found to be reluctant about the structure and presentation of the questionnaire. They tend to neglect the details of sequence, formal, language and behavioral dimension of the questionnaire. This in effect restrains the interest and motivation of the respondents.

Human being is creative by nature and uses his or her own judgment in interpreting questions. Questionnaire, specially the open ended ones, therefore, generates a huge variety of relevant as well as irrelevant information and data. It becomes very difficult to process those data at the later stage.

Researchers also sometime fail to check a sample of nonresponding subject for possible bias.

Schedule

Schedule is a set of questions which are orally asked by a specially trained enumerator and filled in a face to face situation with the respondent. This method of data collection from primary sources is very common where tin-

level of social awareness and literacy rate are relatively low. In this method, a data collector carries a pre-designed information schedule to the informants and records their views, opinions and other relevant data by directly asking¹ some pre set questions contained in the schedule. The data collector then records the replies of the respondents in his own hand in the schedule blanks. In other words, a schedule is a form of questionnaire where the respondent does not write but orally gives his views and the data collector records that accordingly.

Following are the major advantages of this method of data collection:

- It is very useful in those research efforts where the respondents are illiterate and relatively unconcerned.
- The rate of response from the sampled respondent is usually high compared to other methods. Even a reluctant and passive respondent cannot ignore a sincere appeal from the well trained enumerators.
- The level of accuracy is also high. Since the data collectors clearly explain the questions and reply supplementary queries of the respondents, there are lesser chances of misunderstanding the questions by the respondents.

However this method has its disadvantages too:

- If the number of sampled respondent is high and spread around a larger geographical area then this method becomes obviously very expensive.
- Accuracy of data collected through this method depends largely on the skill and efficiency of the data collectors. Moreover, the mode of presentation of the questions, timing, mood and attitude of the data collectors also affect the quality and content of the data.

Data Collection through Agents

This approach is used for data collection of a long range and continuous research projects. Under this method the researcher hires permanent local agents or correspondents who collect and transmit data and relevant information in a regular basis or for a time series to a centrally located research centre. This method is particularly used for collection of data on crop statistics, market prices, weather reports and other routine observations.

Other Methods

In addition to the above mentioned methods there are several other methods of data collection which are widely used in managerial research (Brynan;1989:225-230). Followings are selected few:

Projective Technique

These techniques involve the presentation of ambiguous stimuli to individuals, whose interpretation of the stimuli is taken by the researcher to reveal some underlying characteristics of the individual concerned. A typical example is the "sentence-completion test" in which the individual is asked to complete a number of unfinished sentences. Individual's performance in the test reveals his preparedness to react and response to situation and his role perceptions. Through this technique researcher usually collects data on different aspects of a respondent's personality, behavioral traits that are not normally manifested.

Verbal Protocol

In the area of human problem solving, the verbal protocol approach has been employed in relation to a number of topics relevant to organizational research. The approach involves inducting subjects to think aloud while performing a task. The idea is to elicit their thought processes while they are in the process of making a decision or solving a problem. Subjects' accounts of what they are doing and why they are doing it are usually tape recorded and transcribed, and then a content analysis is done with the aid of a coding scheme to discern fundamental categories of thinking.

Problems of Data Collection

Data collection for research purpose is not an easy task. Researchers face a lot of difficulties in collecting data both from primary and secondary sources. Following are the typical problems that a researcher usually faces in the context of Bangladesh.

Primary Sources

In a country like Bangladesh most research data are needed to be generated from the primary sources specially from the rural areas. Collection of data from villages is quite difficult. Following are few examples:

Old and outdated Maps: Maps are one of the most important ingredients which help researcher in identifying and selecting samples. However, in rural Bangladesh very often it is found that the existing *mouza* and village maps are not updated. The researchers face lot of difficulties in

identifying the sampled unit, i.e., a *mouza* or a *para*. Even the local revenue office (*Tahshildar's office*) or the *Union Parishad* do not systematically keep the records of recent changes.

Demarcation between Para and Villages: In rural Bangladesh, in most cases there are no specific boundaries between *paras* and villages. The local people use a sort of imaginary boundary of their own understanding. For the researcher, being an outsider, it therefore becomes very difficult to make a distinct line of demarcation between villages and *para* which leads to difficulties in choosing the desired sample units.

Time Perception: On an average about eighty five percent of the rural population is illiterate, of which more than ninety percent are adult. Normally this adult population is the general respondent of most of the empirical researches. A great majority of these adult villagers due to their age, illiteracy and cultural make-up hold a peculiar time perception. For an example if someone is asked to mention the date of a particular incidence, he or she is very likely to refer to or relate the date or time with a past occurrence, e.g. like during the big flood, or when the disastrous storm hit the village or when there was severe drought and so on. This ambiguous time indication sometimes leads the researcher to deep confusion.

Privacy: When a data collector approaches to a particular rural respondent, the people of the entire *para* or locality surrounds him with all of their surprises and curiosities. As a result the privacy of the respondent gets disturbed and the true picture of the respondents mind and thought does not come into expression.

Availability of the Respondent: In general the rural people are indeed quite-busy and hard working individuals. They normally spend most of their day time in the field. It is not very easy task to get hold of them and to get their intimate view. In the evening when they are back from the field, by then they are too tired and immediately start the preparation for supper and to retire to bed. The data collector usually tries to catch them at that unholy hour. Due to the fatigue and reluctance the respondents try to conclude the interview sessions summarily or try to answer the question simply to satisfy the investigator. Obviously the quality of data therefore suffers in such crises.

Language: This is the most common problem that the researchers come across. If the researcher is not well versed with the local dialect it

becomes quite difficult for him to converse and get rapport with the local people. Sometimes the villagers also do not understand what the researcher is talking about and merely agree with almost everything asked for.

Fear and Doubt: The researcher or his assistants are strangers to the villagers. It is quite usually found that the village people become doubtful about the intention of the researcher. They presume the data collector as an agent of the government or of the law enforcing agencies who has come in the village to push them in trouble. The villagers therefore do not feel free to express their inner thought to the data collectors. Villagers, specially the landless and marginal farmers either avoid or hide their views and opinions regarding critical issues concerning the role of the power structure, distribution of services, and other aspects related to social dynamics etc. Until and unless the researcher builds a strong personal rapport, they do not speak about the true story.

Mental Astigmatism: It is more of a behavioral problem in data collection from the primary sources. In such cases the respondent thinks that he is giving the correct answer though he is totally wrong. The respondent is guided by some fixed preconceived ideas which are erroneous. The respondent tends to revert to a particular reference point which in most cases is irrelevant to the questions asked. One experienced researcher explains his ordeal (Husain, nd)

"In connection with a survey to construct some index numbers I asked the respondent to indicate how many times the prices of certain goods increased compared with those of 1974. I explained the questions clearly and with care, but I found that the respondents frequently compared the prices with those of pre-liberation days. Their minds were fixed on that period of time.

Another critical issue in primary data collection implies to so-called trespassing respondents sovereignty. This means that the data collectors should not be over curious about the data provided by the respondent. Such a notion would mean accepting more or less inaccurate data as stated by the respondent."

Indifferent Attitude: A significant majority of the rural population are living below the absolute poverty level. On the top of that being illiterate they are not conscious about their minimum rights and privileges. They seem to be indifferent to almost everything. As

respondent they do not find that their views and opinions have any value or worth. As a result they either try to ignore the researcher or tend to remain indifferent while answering any question. Some of the respondents again feel hesitant to express their views with the fear that whatever they say would be below the expected standard. There are examples where the respondents even requested the data collector to note whatever he thinks should be appropriate and record it as their opinion on the particular issue.

Secondary Sources

It is an important source of research data. Collection of data from secondary sources is relatively easy and less time consuming. However, in country like Bangladesh with the given bureaucratic culture, data collection from secondary sources particularly from the public offices is rather difficult. Following are few examples of difficulties that a researcher typically faces in collecting data from the secondary sources.

Public office Secrecy: Due to the lack of popular and political accountability, public offices in Bangladesh are more or less treated as a closed system with limited access of the common people. Like other developing countries, the bureaucracy in Bangladesh treats data and information as secret matter where only selected people with appropriate authority have the access. When the researchers approach a public office for necessary data and information they need all kinds of permission and have to go through several bureaucratic processes.

Fear of Press: The fear of the press and other popular mass media also contribute to the low turnover of the secondary sources of data collection from public offices. The government officials fear that if they provide information to the social researchers that might eventually reach the popular media. The mass media could bring out some of the critical information to the people at large. This could lead them to embarrassing situation. Public officials therefore remain reluctant and passive in supplying data and information of any sort.

Lack of Awareness: Those agencies and individuals who are responsible for the generation and dissemination of data should have a clear understanding about the ultimate use of the data and information. Experience reveals that in many cases those who are the custodian of public information system severely lack the awareness and general understanding regarding the importance of data in social research. The

researchers therefore have to use their behavioral and social skills to convince the sources.

Misreporting: It is a noticeable problem in data collection. It could be intentional or unintentional. Due to fear or conservative cultural mental makeup responsible reporting is not yet in practice in our system. There are ample of evidence that even in officially published reports, the figures quoted are far away from the reality. The field based official normally forwards the data carelessly without scrutiny and sometimes he distorts the data to suit his purpose or advantage.

Poor Data Management: In most governmental agencies, information are not appropriately collected and recorded. Management of information is extremely poor in the public offices. Whatever information is available with these agencies very often is found to be not kept in a systematic manner. Because of poor management, collection of time series data is extremely difficult. In many cases only the current data are kept and rest of the previous year's data is dumped in the store room for ultimate disposal as waste. In addition, because of the sluggish character of public bureaucracy many governmental publications, general statistics hardly get published in time. It therefore, becomes difficult for the researcher to deal with current data. Authenticity of the data and information generated and disseminated by the public offices are also questioned by several observers. The researcher has to be doubled cautious while dealing with public office data. In most cases researchers have to depend on the data published by reputed international and UN agencies.

In summary, there are two problems that one encounters in collecting data: The first is figuring out where is the data available and with whom. The second is gaining access to it.

Finding Data Sources

At the outset of the research, the researcher needs to make full effort to figure out what data he needs. The researcher jots down all research data that are needed regardless whether they are readily available or not. The next step is to look for it. Separating these two processes is important because if both are done at the same time, there might be a tendency to reject suggestions for the need of certain data because such data cannot be immediately available to the researcher.

Researchers need to be innovative in his thinking to find convenient sources of data. As a matter of fact, experience reveals that in most cases

the problem is that there is too much of available data, and the researchers have to spend lot of time to eliminate supportive and tertiary data. In order to identify data sources, one needs to establish a positive frame of mind. Researcher should begin with the attitude that if the data and information are important to him, then it is probably also important to other researchers. There are several professional and organized groups that collect data of diverse interests. The researchers need to trace them.

Data/Information is not always readily available in published form but the researcher requires to take a bit of initiative. Each researcher should have his own "mini data bank" in his field of research interest.

A researcher can obtain valuable information by means of the following step. However, the researcher must depend on his own judgment and initiatives in adapting these:

- Be observant, look around and listen to what you hear. Try in understanding.
- Write down some specific information/data what you think may be of some future use.
- Build a scrapbook and keep selected articles, speeches, pictures, graphs, tables, charts, maps etc.
- Develop a regular habit of reading newspaper, magazine and make note where necessary.
- Maintain a card file.
- Use Library and Reference Sources.

Quick Reference Sources

There are some conventional sources of quick references. These sources usually provide basic information regarding different field of interest which are readily available in almost all libraries and data banks. Following are the conventional sources of quick data and information retrieval:

- Almanac
- Encyclopedias
- Special Dictionaries
- Published Catalogue
- Government Publication Services
- Newspaper

- Magazine Articles
- Telephone Directories
- Using the Primary Source

Selected Research Institutions in Bangladesh

For the last two decades there have been some improvements in the development and generation of social research data. In spite of resource limitations, several new research and development organizations have been developed. Old institutions were revitalized in the light of the changed socio-economic reality of the independent Bangladesh. Following are some of the selected research organizations those are involved in social research in Bangladesh.

Accident Research Institute: Core area of specialization: urban development, transport management and accident, www.buet.ac.bd/ari/

Bangladesh Academy for Rural Development: Core area of specialization: rural development, cooperative, livelihood development, local governance. www.bard.gov.bd

Bangladesh Centre for Advanced Studies (BCAS): Core area of specialization: environment and sustainable development, www.bcas.net

Bangladesh Institute of International and Strategic Studies (BISS): Core area of specialization - international relations, security studies, globalization, civil-military relations, regional studies etc. www.biiss.org

Bangladesh Social Science Research Council (BSSRC). Core area of specialization: It is national data bank of various research reports in the field of social science.

Bangladesh Bureau of Educational Information and Statistics (BANBEIS): Core area of specialization: Education research and management.

Bangladesh Bureau of Statistics (BBS): The Bangladesh Bureau of Statistics is a government department provides different-forms and types of demographic and development data, www.bbs.gov.bd

Bangladesh Environmental Lawyers Association (BELA): Core area of specialization: environment law, conservation of nature and development, www.belabangla.org

Board of Investment (BOI): Data related to investment, business climate etc. www.boi.gov.bd

Centre for Policy Dialogue (CPD): Core area of specialization: specialization on economic governance, policy reform, policy analysis and development. www.cpd.org.bd

Centre for Urban Studies (CUS): Core area of specialization: urban governance, urban planning and development.

International Centre for Diarrheal Disease Research, Bangladesh (ICDDR,B): Core area of specialization: health management, population, nutrition etc. centre.icddr.org

Institute of Governance Studies (IGS): Core area of specialization : governance, public sector reform, media etc igs-bracu.ac.bd

Institute of Business Administration (IBA): University of Dhaka. Core area of specialization: business management, industries, Public Private Partnership etc. www.iba-du.edu

Institute of Statistical Research and Training (ISRT): Core area of specialization: Statistical training and analysis of social and development indicators, University of Dhaka, www.isrt.ac.bd

Institute of Bangladesh Studies (IBS): Core area of specialization: culture and development, governance, politics and economic development polity analysis, www.rabd.net

Rural Development Academy Bogra (RDA): Core area of specialization rural development, cooperative, agricultural development, irrigation management, livelihood development, local governance, www.rda.gov.bd

SDNP Bangladesh: Sustainable Development Information Data Bank. www.sdnbd.org

Institute of Social Welfare and Research, Dhaka University (ISWR): Core area of specialization: social welfare, vulnerabilities, safety net etc.

Bangladesh Public Administration Training Centre (BPATC): Core area of specialization: Public administration, governance, public sector reform, training and development, www.bpatc.org.bd

National Institute of Local Government (NILG): Core area of specialization: Local and urban government and governance, local level planning etc.

Selected International/Regional Research Bodies

DARE- UNESCO Social Sciences Database: It is a database that offers over 11000 references to social science periodicals. It also contains special references to peace, human rights and international law research institutes.

MOST - Management of Social Transformations Programme is a data bank designed by UNESCO to promote international comparative social science research. It also publishes state of the art reports that assess existing information on specific topics. MOST concentrates on research areas like cities and urban governance, social transformation, Globalization and Governance.

NESSTAR - Networked Social Science Tools and Resources: It is an infrastructure for data dissemination via the Internet created by a consortium of data archives. NESSTAR Explorer is an end user interface for searching, analyzing and downloading data and documentation via the Internet. NESSTAR provides multiple data sources across national boundaries.

OECD - Organization for Economic Cooperation and Development provides extensive data of the different governments on development, economic and social policy.

UNICEF - United Nations Children's Emergency Fund: UNICEF data bank provides a wealth of information, as well as statistical data broken down by country on children and related development indicators. It also provides various world maps for selected indicators.

UNHCR - United Nations High Commissioner for Refugees: The site includes timely and issue-oriented information, an annual statistical overview of refugee activities, documents on refugees, and country-specific reports.

United Nations InfoNation: It is an easy-to-use, two-step database that allows the researcher to view and compare the most up-to-date statistical data for the Member States of the United Nations.

UNRISD - United Nations Research Institute for Social Development
The site provides data and information on global conferences, publications, policy briefs and viewpoints on social development.

World Bank: Data and Statistics: Offers access to national and international statistics and global development statistics. Researcher can select the data by country or topics. The site includes the *Social Indicators*

of Development, Trends in Developing Economies, and the Annual Reports etc.

World POPClock: An up-to-the day estimate of the world's population and population projections to the year 2050. Graphics based on World population, World population growth rates, "and Annual world population change.

Other Sources

There are other sources/data archives like: Social Science Data Resources, Search for Social Sciences Data on the Net , International Association for Social Science Information Services and Technology [IASSIST] (It is the home page of the social science data archivists of the world.), Social Science Data Analysis Network (SSDAN), The U.S. Gallup Poll Organization, World Data on Education - International Bureau of Education (IBE), Swiss Information and Data Archive, Danish Data Archive, International Monetary Fund (IMF), IMF financial statistics for governments, international trade, and direction of trade, World Trade Organization (WTO).

CHAPTER

8

Date Presentation and Analysis

CHAPTER 8

Data Presentation and Analysis

A researcher needs to put a considerable amount of time, effort and energy in designing a conceptual and theoretical framework to guide the research, it is then followed by further conceptualization and operationalization of key variables.

Once the research design is complete, the researcher devotes his time to collect the data and information in the light of the research questions of the study. The researchers have to be very careful in their analysis of the data. Data analysis refers to a process whereby the researcher examines the data in order to give a meaningful interpretation and analysis of the significance and tendency of the data based on the theoretical and analytical framework and the proposed hypothesis and or the model. In other words data analysis produces significant inferences or insights with respect to the data within the given theoretical model.

It is therefore very important to specifically plan for the approaches and methods to be utilized for data analysis. As a matter of fact, data analysis as the final stage of research, discovers how accurate the initial predictions have been and whether it can extract new insights from any unanticipated results for future research.

The purpose of data analysis is to determine the broader meaning of the data that has been analyzed, and to suggest how the interpretations relate to the existing knowledge base. In many cases at this stage of the research new knowledge are developed, previously held views are either confirmed or rejected, newer hypotheses and propositions are formed.

During the recent years, the quantitative data analysis, as method, has evolved considerably and is comparable across a wide variety of substantive disciplines. However, this does not necessarily suggest that such analyses are simple or straight forward, nor does it mean that insights are not needed in order to interpret unexpected findings or to make sense of very complicated and sometimes ambiguous data. What it does mean is that the principles of analysis can be stated abstractly in terms of mathematical and statistical theorems. Such theorems tell us the following (Blalock and Blalock ; 1982):

There are better and worse ways to proceed.

- Some procedures produce known biases.
- Some are more efficient than others.
- Certain things can be expected to happen when control variables are introduced in a specified model.

- Probability statements can be made about the likelihood of certain results occurring by chance.
- Some ways of simplifying information are superior to others under specifiable conditions.
- Before starting with any statistical computation and analysis – a researcher should always be very skeptical and critically ask himself the following questions (Blalock and Blalock; 1982):
- Have you looked at all or most of the important variables?
- Have you measured them appropriately?
- Have you made the analysis so complex that the research consumer cannot "see through" the density of the factual data?
- Have you oversimplified the analysis by omitting important control variables?
- Have you made too much of very weak correlations?
- Have you tested relationships for "statistical significance?"

That is, can you assure the consumer that these relationships did not happen as a result of chance or sampling error?

The answers to these questions therefore logically establish the foundation for the interpretation of research findings. The primary intention of data analysis is therefore, to extract the explicit and implicit meaning of the data in the light of the presumed theoretical relationships.

Editing Data

Once the primary and secondary data are collected, the next important step is to carefully and critically examine and edit the data. The main objective of editing data is to eliminate the possible errors and omissions. While editing data following considerations need studious attention of the researcher (Gupta;1980):

- a. Data should be complete;
- b. Data should be consistent;
- c. Data should be accurate, and
- d. Data should be homogenous.

Editing data practically begins with the careful examination of the questionnaires and or the schedules which provide the basic and primary data. Each questionnaire or schedule should be complete and all items and or questions have to be appropriately responded. If in some cases, the data/information are found to be incomplete, inconsistent and mutually contradictory, the researcher should either refer back the questionnaire to

the respective respondent or contact the enumerator for further clarification. It is advisable that the researcher should personally see the respondent and review the condition for himself. However, if the respondent can not at all be contacted, the questionnaire should be cancelled. Researchers should be very cautious about missing data. This not only weakens the research validity but also steers to misleading inferences. The researcher should also carefully examine the data in order to see the homogeneity. By homogeneity it means whether all the questions that have been asked to the respondent have been understood in the same sense. The researcher should therefore carefully check all the questionnaires and ensure that all questions have uniform interpretation. At this stage, the researcher also enters the figures that have to be calculated in order to complete the answer given by the respondent. One has to remember that respondents should never be asked to make any calculations in order to make his response complete. The final activity of the editing of data is the codification of the answers as and when necessary.

Coding consists of giving a code number to each classification. Items can then be sorted under code number (Figure 8.1)

Classification of data

This is the first stage of data analysis. Classification of data simply means systematically organizing and sorting of the data on the basis of some predetermined variables or attributes. In its simplest sense, classification is nothing but the grouping of related facts and

Information into some classes to draw some meaning and sense out of it. The main objectives of classifying data are :

- a. to deduce the body of data in such a manner that the presented data distinctly reveal their features, characteristics and similarities;
- b. to Highlight the most remarkable and significant features and concentration of data at a sweeping glance; and
- c. to facilitate further statistical computation and comparison.

Social researchers generally use four broad pattern of classification of data. These are as follows:

- a. Quantitative; b. Qualitative; c. Chronological; and d. Geographical

Figure 8.1 Practice example – Classification

Examples of coding areas following :

To designate sex, two code number would be required. 1 for male and 2 for female; if it were required to classify income in four groups ;

1 could be used for under Tk. 1000

2 for 2000 up to 3600

3 for 3000 to up to 4000 and

4 for 4000 and above etc.

Quantitative classification

This type of classification is based on the distinct quantitative characteristics which can be measured by different specific scale of measurement like weight, length etc.

Qualitative classification

Recorded data of non- quantitative nature and with qualitative and descriptive features are classified through qualitative classification. Some quality or attributes like sex, race, literacy, religion, language etc. are normally used as the basis of this type of classification.

Chronological classification

This type of classification is used when data and information regarding some processes or activities are recorded over a long period of time. Chronological classification is also known as time series data classification where collected data are organized starting with a base or reference year.

Geographical classification

Data and information in this type of classification are classified according to the geographical or locational difference.

Measurement

Measurement is often viewed as being the basis of all scientific inquiry, and measurement techniques and strategies are therefore an essential component of research methodology. *Measurement* can be defined as a process through which researchers describe, explain, and predict the phenomena (Kaplan, 1964; Pedhazur & Schmelkin, 1991). For example, we measure how long it takes to reach a particular position in an organizational hierarchy, the distance between two points in miles. Important decisions are based on performance on standardized tests that measure intelligence, aptitude, achievement, or individual adjustment. Measurement is as important in our daily existence as it is in the context of research design. Measurement enables researchers to quantify abstract constructs and variables as research is usually conducted to explore the relationship between independent and dependent variables.

Variables in a research study typically must be operationalized and quantified before they can be properly studied (Kerlinger, 1992). An *operational definition* takes a variable from the theoretical or abstract to the concrete in defining the variable in the specific terms of the actual procedures used by the researcher to measure or manipulate the variable. In summary, measurement is important in research design in two critical areas. First, measurement allows researchers to quantify abstract constructs and variables. Second, the level of statistical sophistication used to analyze data derived from a study is directly dependent on the scale of measurement used to quantify the variables of interest.

Scales of Measurement

There are four main scales of measurement subsumed under the broader categories of *non-metric* and *metric* measurement: nominal scales, ordinal scales, interval scales, and ratio scales.

Metric measurement scales: Nominal and ordinal scales are non-metric measurement scales.

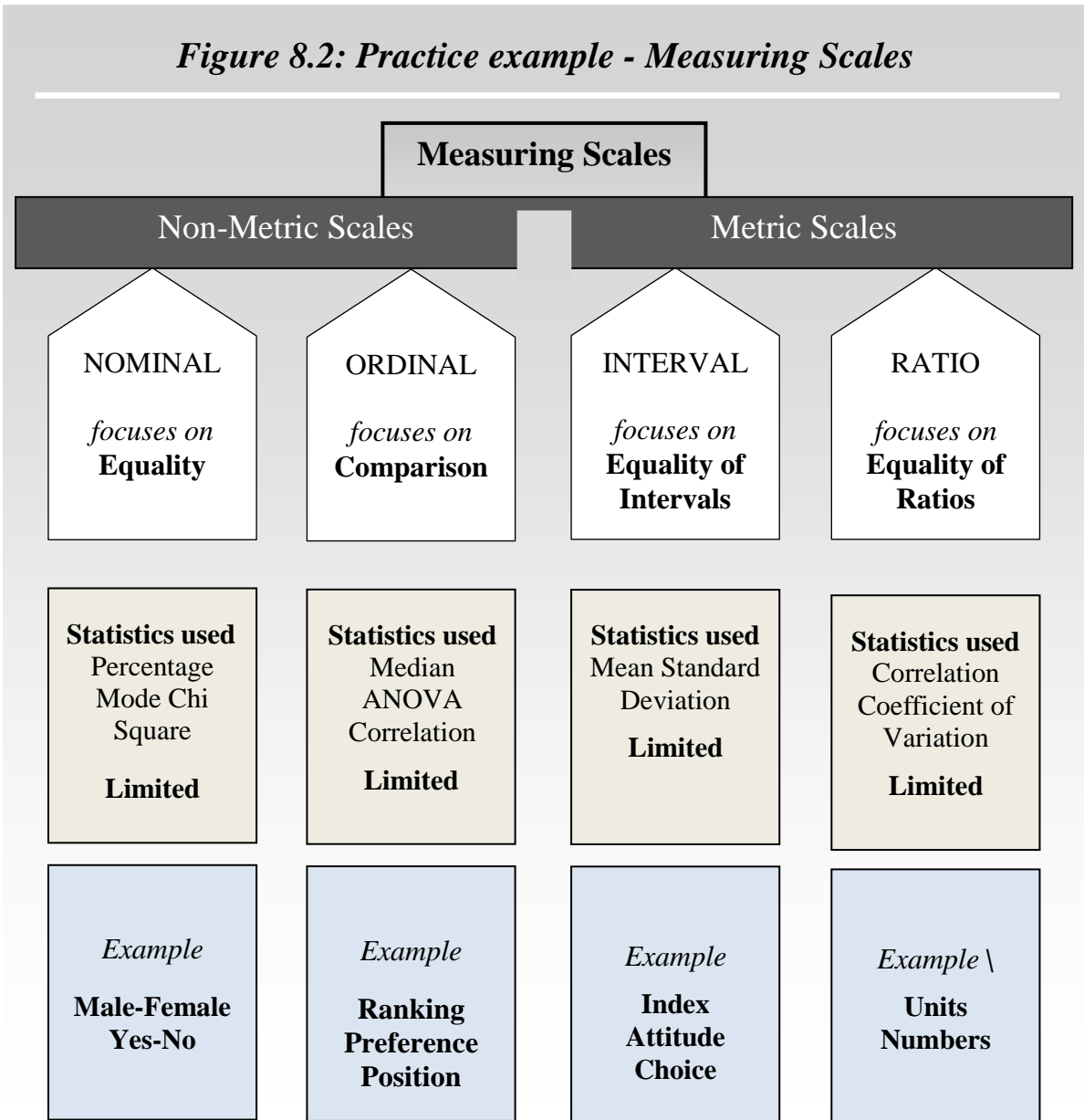
- i. *Nominal scales* are the least sophisticated type of measurement and are used only to qualitatively classify or categorize. They have no absolute zero point and cannot be ordered in a quantitative sequence, and there is no equal unit of measurement between categories. In other words, the numbers assigned to the variables have no mathematical meaning beyond describing the characteristic or attribute under consideration—they do not imply amounts of an attribute or characteristic. This makes it impossible to conduct standard mathematical operations such as addition, subtraction, division, and multiplication.
- ii. The second type of non-metric measurement scale is known as the *Ordinal scale*. Unlike the nominal scale, *ordinal scale* measurement is characterized by the ability to measure a variable in terms of both *identity* and *magnitude*. This makes it a higher level of measurement than the nominal scale because the ordinal scale allows for the categorization of a variable and its relative magnitude in relation to other variables. Variables can be ranked in relation to the amount of the attribute possessed. In simpler terms, ordinal scales represent an ordering of variables, with some number representing more than another. One way to think about ordinal data is by using the concept of greater than or less than, which incidentally also highlights the main weakness of ordinal data.

Non-metric measurement scales: Interval and ratio scales are the two types of metric measurement scales, and are quantitative in nature. Collectively, they represent the most sophisticated level of measurement and lend themselves well to sophisticated and powerful statistical techniques.

- i. *The Interval scale* of measurement builds on ordinal measurement by providing information about both order and distance between values of variables. The numbers on an interval scale are scaled at equal distances, but there is no absolute zero point. Instead, the zero point is arbitrary. Because of this, addition and subtraction are possible with this level of measurement, but the lack of an absolute zero point makes division and multiplication impossible.
- ii. The second type of metric measurement scale is the *ratio scale* of measurement. The properties of the ratio scale are identical to those of

the interval scale, except that the ratio scale has an absolute zero point, which means that all mathematical operations are possible.

Figure 8.2: Practice example - Measuring Scales



Selection of Appropriate Statistics

How does a researcher select the appropriate statistics or research tools to use in a study? The level of data at which the variables in the research study are measured, as well as the questions the researcher is trying to address determine which statistic or set of statistics is most appropriate.

- i. Number of Variables:* One way to distinguish groups of statistics is by the number of variables under study. Simple statistics accommodate fewer variables. More complex statistics accommodate several variable simultaneously. Univariate statistics are applied to only variable. Bivariate statistics are applied to two variables. They have the

advantage of allowing for an independent as well as a dependent variable in the formal analysis. Multivariate statistics accommodate several variables at once. Multivariate statistics allow for the impact of several independent variables on the dependent variable to be examined simultaneously, or for clustering patterns across several variables to be explored. Rarely do multivariate statistical models accommodate several dependent variables simultaneously. Since multivariate statistics allow for greater complexity as well as statistical controls to be used, researchers favor their use whenever possible (Babbie, 1990).

- ii. Generalizability of Results:* Another way to distinguish statistics is by whether or not the purpose of the statistic is to generalize the analytic, results beyond the data at hand. Descriptive statistics do not generalize, and are used to describe an entire population. Inferential statistics are developed to generalize from a sample to a larger population (Babbie, 1995). The statistical models for descriptive statistics and inferential statistics are often very similar, and at times, even identical. A primary difference is that inferential statistics assume random sampling, and therefore a knowable and calculable standard error to measure sampling error. If sampling error can be reasonably and reliably calculated, then the researcher can make inferences from a sample to a larger population, knowing the probability of making a Type I and Type II error, and able to create a band of confidence around any point estimates. To accommodate this, inferential statistics use degrees of freedom in the calculation of variance and standard error, rather than the total number of cases in the population as descriptive statistics use. Degrees of freedom refer to the number of independent pieces of information used in calculating the statistics, which often is the number of cases minus the number of other statistics that must be estimated from sample data (and therefore, depend on the sample itself) to derive the statistical estimate in question.
- iii. Underlying Statistical Distributions :* Statistics also vary according to their assumptions about underlying distributions. Nonparametric statistics do not assume a normal distribution. They have less restrictive assumptions, but are used less commonly. By contrast, parametric statistics do assume the normal distribution. This assumption is more restrictive but due to the law of large numbers as well as the ability to apply parametric statistics to higher level data, parametric statistics are commonly used (Blalock,1979).

- IV. **Questions Answered:** Statistics may be used to answer one of five questions. Some statistics answer only one problem or question, while a few more complex parametric statistics applied to higher level data may answer or yield results for several of the questions.

Data Analysis and Interpretation

In order to draw meaningful inferences and comprehensive conclusions the collected data must be properly processed and analytically presented. At the outset the researcher has to make his mind as to how he is going to process his data. Data can be processed both manually as well as with the use of computers. At this stage the researcher has to decide how he is going to present his findings and what types of direct and cross tables he will produce. The nature of the tables to be prepared helps the researcher to determine the method of data processing. If the number of cross table is small, a manual method of data processing may serve the purpose, but if the number is large, use of computer becomes inevitable.

Analysis of data therefore calls not only for technical skills but also for judgment regarding the strong and weak points of the research methodology and data (Shah; 1977).

Interpretation is often inter-woven with analysis, and problems of analysis and interpretation of data differ for different study designs. There is only a thin line separating *interpretation* from *generalization* (Franklin and Osborne; 1971). The purpose of *interpretation* is to find the meaning of the data, to look for the explanation of the observed relationships. In general, interpretation means an adequate exposition of the true meaning of the data presented, in terms of the purposes of the study being reported. It highlights the real significance of the findings. It also includes the wider implications of the data, and gives hints of logically lead conclusions and recommendations.

The purpose of *generalization* is *action* is to indicate the extent to which they could be applied to the population or to other similar groups. After having processed and analyzed the assembled quantitative data, in order to draw interpretation and generalization the researcher therefore needs to present the data in a suitable and logically consistent tabular and or pectoral form. The primary objective of this tabular presentation is to present, in a summary form, the general concentration and the distribution of the quantitative data. As to develop generalizations concerning the research problem, the data which has been presented in tables are discussed and interpreted in the light of the theoretical framework and the hypothesis. A

table attempts to present and summarize data as well as draw the attention of the readers to their outstanding features (Shah; 1977).

Once the researcher has assimilated his data base, the next step is to develop it strategy for presenting and discussing them. The researcher at this stage follows the already designed conceptual scheme for relating the tables and the general features of the data.

The researcher should be artful in presenting his tables and data. The presentation and general discussion should preferably start from simple to relatively intricate and complex matters. As a matter of principle, all supporting data needed for addressing the major research problem should BE discussed before the complex tables are presented. The researcher should start with an assumption that the audience of the research report are laymen and need to be thoroughly familiarized with the various aspects of the data in a gradual manner. The sequential arrangement of the tables should be such that the description of data, examination of relationships, and arguments for testing the hypotheses are presented in a logical order.

In the descriptive presentation, the researcher should give clear indication as how to read and examine the data presented in a given table, chart or graph. The researcher however, does not need to simply repeat the title, column and row headings or the figures in the table by rows and columns. Instead, attempts should be made to draw the attention of the audience reader to the different dimensions of the figures in a table in a logically consistent manner.

Monroe (1980:184) provides a suggestive guideline for the researchers as how to plan the interpretation of data:

- i. For each chart, graph, or table, fill in what you expect to get in the way of results. On the basis of what you know about the subject, guess.
- ii. Look very carefully at your guess. Speculate on what it will mean if your guess is right and what it will mean if you are wrong.
- iii. Take your guess with tentative figures to a statistician. Find out whether your guess represents anything significant; find out whether these figures would represent anything significant. Determine with the statistician how the data can be analyzed.
- iv. Think very carefully about your data collection methods and try to identify any element of methods that might bias the results, that might have the effect of making your guess come true- regardless of the true data.

In addition, there are some general principles that should guide the researchers in presenting the data, these are :

- i. The target reader's attention should only be drawn only to the outstanding items or figures presented through the table.
- ii. In interpreting the data the researcher should start from the obvious and observable trend of the data for the total group, and then deal with the outstanding trends of the data for the subgroups.
- iii Data should be presented in such a manner that they yield answers to the research questions.

Due to several factors data may not be cent percent accurate. Moreover the research methods have also its limitations too. The researchers therefore need to be highly cautious while interpreting the findings and drawing generalizations. There are at least three particular areas where the researcher needs to be particularly cautious (Shah; 1977).

The first caution concerns the question of how to determine the differences in the magnitude of the statistics used for comparing two groups as significant. The usual procedure in statistical analysis is to use an appropriate test of statistical significance. However, the interpretation of the results of significance tests need careful understanding. It is to be noted that the magnitude of difference between two groups has a meaning in relation to the size of the groups as well as the importance of the factors leading to the difference.

The significance test that produces a negative result does not necessarily mean that the differences do not exist in the population. Statistically it simply means that these particular samples do not show a difference. Moreover, a relatively small difference between two large groups may have very important implications in a wider and macro level analysis. It is therefore suggested that whether the researcher uses statistical tests of significance or not, attempts should be made to interpret the differences in terms of their substantive importance to the population.

The second caution is related to the explanation of the observed relationships between and among variables. It is not enough to simply demonstrate that two or more variables are related. It has to be explained further that why and how this relationships stand so.

The third caution concerns the inferences of causal relationship. It should be remembered that one should not make causal inferences simply on the basis of correlation coefficients alone.

When interpreting correlation coefficients, researcher should take care to particularly avoid using any causal terminology. If at all the researcher is interested in interpreting the data in causal terms, appropriate technique should be used.

There are some selected techniques that are available to develop model of causal relationships. Researcher therefore must pay adequate attention to the choice of appropriate technique and the assumptions required for interpreting the findings in causal terms.

The researcher should hold their temptation to draw broad generalization covering the entire country on the basis of the results and data drawn from only a certain segment of the population in a given study area confined to particular geographical area say a district, town or city.

Social events are fast changing. What is true and valid in one time context may have a different meaning altogether in different time frame. Time dimension, therefore, is an important factor that affects the generalization of the research findings. If data under review are outdated and too far from the present, the researcher must acknowledge the limitations of their application to the changed circumstances.

The most important consideration for data interpretation is the support drawn from a logically constructed theoretical framework. Findings of a research therefore cannot be interpreted and generalized in isolation or vacuum rather it should be guided by established theoretical constructs. All interpretation must be backed by convincing and valid theories.

Steps in Data Analysis

In most types of research studies, the process of data analysis involves the following three steps: (1) preparing the data for analysis, (2) analyzing the data, and (3) interpreting the data (i.e., testing the research hypotheses and drawing valid inferences).

1. Data Preparation: Virtually all studies, from surveys to randomized experimental trials, require some form of data collection and entry. Data represent the fruit of researchers' labor because they provide the information that will ultimately allow them to describe phenomena, predict events, identify and quantify differences between conditions, and establish the effectiveness of interventions. Because of their critical nature, data should be treated with the utmost respect and care. In addition to ensuring the confidentiality and security of personal data, the researcher should carefully

plan how the data will be logged, entered, transformed and organized into a database that will facilitate accurate and efficient statistical analysis.

Data Screening: Immediately following data collection, but prior to data entry the researcher should carefully screen all data for accuracy. The promptness of these procedures is very important because research staff may still be able to recontact study participants to address any omissions, errors, or inaccuracies. In some cases, the research staff may inadvertently have failed to record certain information (e.g., assessment date, study site) or perhaps recorded a response illegibly. In such instances, the research staff may be able to correct the data themselves, if too much time has not elapsed. Because data collection and data entry are often done by different research staff, it may be more difficult and time consuming to make such clarifications once the information is passed on to data entry staff. One way to simplify the data screening process and make it more time efficient is to collect data using computerized assessment instruments. Computerized assessments can be programmed to accept only responses within certain ranges, to check for blank fields or skipped items, and even to conduct cross-checks between certain items to identify potential inconsistencies between responses. Another major benefit of these programs is that the entered data can usually be electronically transferred into a permanent database, thereby automating the data entry procedure. Although this type of computerization may, at first glance, appear to be an impossible budgetary expense, it might be more economical than it seems when one considers the savings in staff time spent on data screening and entry. Whether it is done manually or electronically, data screening is an essential process in ensuring that data are accurate and complete. Generally, the researcher should plan to screen the data to make certain that (1) responses are legible and understandable, (2) responses are within an acceptable range, (3) responses are complete, and (4) all of the necessary information has been included.

Transforming Data: After the data have been entered and checked for inaccuracies, the researcher or data entry staff will undoubtedly be required to make certain transformations before the data can be analyzed. These transformations typically involve the following: a. Identifying and coding missing values, b. Computing totals and new variables, c. Reversing scale items, d. Receding and categorization.

Identifying and Coding Missing Values: Virtually all databases have some number of missing values. Unfortunately, statistical analysis of data sets

with missing values can result in biased results and incorrect inferences. Although numerous techniques have been offered to impute missing values, there is an ongoing debate in contemporary statistics as to which technique is the most appropriate.

A few of the more widely used imputation techniques include the following:

Hot deck imputation: In this imputation technique, the researcher matches participants on certain variables to identify potential donors. Missing values are then replaced with values taken from matching respondent (i.e. respondents who are matched on a set of relevant factors).

Predicted mean imputation: Imputed values are predicted using certain statistical procedures (i.e., linear regression for continuous data and discriminant function for dichotomous or categorical data).

Last value carried forward: Imputed values are based on previously observed values. This method can be used only for longitudinal variables, for which participants have values from previous data collection points.

Group means: Imputed variables are determined by calculating the variable's group mean (or mode, in the case of categorical data).

2. Data Analysis

Research data can be seen as the fruit of researchers' hard work and labor. If a study has been conducted in a scientifically rigorous manner, the data will hold the clues necessary to answer the researchers' questions. To unlock these clues, researchers typically rely on a variety of statistical procedures. These statistical procedures allow researchers to describe groups of individuals and events, examine the relationships between different variables, measure differences between groups and conditions, and examine and generalize results obtained from a sample back to the population from which the sample was drawn. Knowledge about data analysis can help a researcher interpret data for the purpose of providing meaningful insights about the problem being examined. Although a comprehensive review of statistical procedures is beyond the scope of this text, in general, they can be broken down into two major areas: descriptive and inferential. *Descriptive statistics* allow the researcher to describe the data and examine relationships between variables, while *inferential statistics* allow the researcher to examine causal relationships. In many cases, inferential statistics allow researchers to go beyond the parameters of their study sample and draw conclusions about the population from which the sample was drawn.

Descriptive Statistics- As their name implies, descriptive statistics are used to describe the data collected in research studies and to accurately characterize the variables under observation within a specific sample. Descriptive analyses are frequently used to summarize a study sample prior to analyzing a study's primary hypotheses. This provides information about the overall representativeness of the sample, as well as the information necessary for other researchers to replicate the study, if they so desire. In other research efforts (i.e., purely descriptive studies), precise and comprehensive descriptions may be the primary focus of the study. In either case, the principal objective of descriptive statistics is to accurately describe distributions of certain variables within a specific data set. There is a variety of methods for examining the distribution of a variable. Perhaps the most basic method, and the starting point and foundation of virtually all statistical analyses, is the frequency distribution. A *frequency distribution* is simply a complete list of all possible values or scores for a particular variable, along with the number of times (frequency) that each value or score appears in the data set. For example, a HR officer who wants to know the annual performance score of a given unit will need to examine the overall distribution of the performance score. The HR personnel would begin by sorting the scores so that they go from the lowest to the highest and then count the number of times that each score occurred. This information can be delineated in what is known as a *frequency table*.

The *central tendency* of a distribution is a number that represents the typical or most representative value in the distribution. Measures of central tendency provide researchers with a way of characterizing a data set with a single value. The most widely used measures of central tendency are the mean, median, and mode. The *mean*, except in statistics courses and scientific journals, is more commonly known as the average. The mean is perhaps the most widely used and reported measure of central tendency. The mean is quite simple to calculate: Simply add all the numbers in the data set and then divide by the total number of entries. The result is the mean of the distribution. The mean is quite accurate when the data set is normally distributed. Unfortunately, the mean is strongly influenced by extreme values or outliers. Therefore, it may be misleading in data sets in which the values are not normally distributed, or where there are extreme values at one end of the data set (skewed distributions).

Dispersion: Measures of central tendency, like the mean, describe the most likely value, but they do not tell us anything about how the values vary. For example, two sets of data can have the same mean, but they may vary

greatly in the way that their values are spread out. Another way of describing the shape of a distribution is to examine this spread. The spread, more technically referred to as the *dispersion*, of a distribution provides us with information about how tightly grouped the values are around the center of the distribution (e.g., around the mean, median, and/ or mode). The most widely used measures of dispersion are range, variance, and standard deviation. The *range* of a distribution tells us the smallest possible interval in which all the data in a certain sample will fall. Quite simply, the range is the difference between the highest and lowest values in a distribution. Therefore, the range is easily calculated by subtracting the lowest value from the highest value. A more precise measure of dispersion, or spread around the mean of a distribution, is the *variance*. The *variance* gives us a sense of how closely concentrated of values is around its average value, and is calculated in the following manner:

- Subtract the mean of the distribution from each of the values.
- Square each result.
- Add all of the squared results.
- Divide the result by the number of values minus 1.

The variance and the standard deviation of distributions are the basis for calculating many other statistics that estimate associations and differences between variables. In addition, they provide us with important information about the values in a distribution. For example, if the distribution of values is normal, or close to normal, one can conclude the following will reasonable certainty:

1. Approximately 68% of the values fall within 1 standard deviation of the mean.
2. Approximately 95% of the values fall within 2 standard deviations of the mean.
3. Approximately 99% of the values fall within 3 standard deviations of the mean.

Measures of Association: Another important task of descriptive statistics is to examine and describe the relationships or associations between variables. Correlations are perhaps the most basic and most useful measure of association between two or more variables. Expressed in a single number called a *correlation coefficient* (r), correlations provide information about the direction of the relationship (either positive or negative) and the

intensity of the relationship (-1.0 to +1.0). Furthermore, tests of correlations will provide information on whether the correlation is statistically significant. There is a wide variety of correlations that, for the most part, are determined by the type of variable (e.g., categorical, continuous) being analyzed. With regard to the direction of a correlation, if two variables tend to move in the same direction (e.g., height and weight), they would be considered to have *a. positive or direct relationship*.

Alternatively, if two variables move in opposite directions, they are considered to have a *negative or inverse relationship*. Correlation coefficients range from -1.0 to +1.0. The sign of the coefficient represents the direction of the relationship. For example, a correlation of .73 would indicate a positive or direct correlation, while a correlation of -.73 would indicate a negative or inverse correlation. The coefficient (value) itself indicates the strength of the relationship. The closer it gets to 1.0 (whether it is negative or positive), the stronger the relationship. In general, correlations of .01 to .30 are considered small, correlations of .30 to .70 are considered moderate, correlations of .70 to .90 are considered large, and correlations of .90 to 1.00 are considered very large. Importantly, these are only rough guidelines. A number of other factors, such as sample size, need to be considered when interpreting correlations.

In addition to the direction and strength of a correlation, the coefficient can be used to determine the proportion of variance accounted for by the association. This is known as the *coefficient of determination* (r^2). The coefficient of determination is calculated quite easily by squaring the correlation coefficient. For example, if we found a correlation of .70 between two variables (motivation and annual performance score), we could calculate the coefficient of determination in the following manner: $0.70 \times 0.70 = .49$. The coefficient of determination is then transformed into a percentage. Therefore, a correlation of .70, as indicated in the equation, explains approximately 49% of the variance. We could therefore conclude that 49% of the variance in performance score is accounted for by motivation score.

Although correlations are typically regarded as descriptive in nature, they can—unlike measures of central tendency and dispersion—be tested for *statistical significance*. Tests of significance allow us to estimate the likelihood that a relationship between variables in a sample actually exists in the population and is not simply the result of chance. In very general terms, the significance of a relationship is determined by comparing the results or findings with what would occur if the variables were totally

unrelated (independent) and if the distributions of each dependent variable were identical. The primary index of statistical significance is the p -value. The p -value represents the probability of chance error in determining whether a finding is valid and thus representative of the population. For example, if we were examining the correlation between two variables, a p -value of .05 would indicate that there was a 5% probability that the finding might have been a fluke. Therefore, assuming that there was no such relationship between those variables whatsoever, we could expect to find a similar result, by chance, about 5 times out of 100. In other words, significance levels inform us about the degree of confidence that we must have in our findings.

Inferential Statistics

Inferential statistics help us to draw conclusions beyond our immediate samples and data. For example, inferential statistics could be used to infer from a relatively small sample of employees, what the job satisfaction is likely to be for a company's entire work force. Similarly, inferential statistics could be used to infer, from between-group differences in a particular study sample, how effective a new treatment or medication may be for a larger population. In other words, inferential statistics help us to draw general conclusions about the population on the basis of the findings identified in a sample. However, as with any generalization, there is some degree of uncertainty or error that must be considered. Fortunately, inferential statistics provide us with not only the means to make inferences, but the means to specify the amount of probable error as well.

There are numerous inferential statistics for researchers to choose from. The selection of the appropriate statistics is largely determined by the nature of the research question being asked and the types of variables being analyzed. Because a comprehensive review of inferential statistics could fill many volumes of text, we will simply provide a basic overview of several of the most widely used inferential statistical procedures, including the t -test, analysis of variance (ANOVA), chi-square, and regression.

T-Test

T -tests are used to test mean differences between two groups. In general, they require a single dichotomous independent variable (e.g., an experimental and a control group) and a single continuous dependent variable. For example, t -tests can be used to test for mean differences between experimental and control groups in a randomized experiment, or to

test for mean differences between two groups in a non-experimental context. When a researcher wishes to compare the average (mean) performance between two groups on a continuous variable, he or she should consider the *t*-test.

ANOVA

ANOVA works by comparing the differences between group means rather than the differences between group variances. The name "analysis of variance" comes from the way the procedure uses variances to decide whether the means are different. An ANOVA is also a test of mean comparisons. In fact, one of the only differences between a *t*-test and an ANOVA is that the ANOVA can compare means across more than two groups or conditions. Therefore, a *t*-test is just a special case of ANOVA. If we analyze the means of two groups by ANOVA, we get the same results as doing it with a *t*-test although a researcher could use a series of *t*-tests to examine the differences between more than two groups.

Chi-Square (K^2)

The inferential statistics that we have discussed so far (i.e., *t*-tests, ANOVA) are appropriate only when the dependent variables being measured are continuous (interval or ratio). In contrast, the *chi-square statistic* allows us to test hypotheses using nominal or ordinal data. It does, this by testing whether one set of proportions is higher or lower than you would expect by chance. Chi-square summarizes the discrepancy between observed and expected frequencies. The smaller the overall discrepancy is between the observed and expected scores, the smaller the value of the chi-square will be. Conversely, the larger the discrepancy is between the observed and expected scores, the larger the value of the chi-square will be.

Regression

Linear regression is a method of estimating or predicting a value on some dependent variable given the values of one or more independent variables. Like correlations, statistical regression examines the association or relationship between variables. Unlike with correlations, however, the primary purpose of regression is prediction. For example, social trust of a given society may be predicted by variables like status of social capital, enforcement of law, transparency, scope for participation and right to information etc. There are two basic types of regression analysis: simple regression and multiple regression. In *simple regression*, we attempt to predict the dependent variable with a single independent variable. In

multiple regression, as in the case of the insurance adjuster, we may use any number of independent variables to predict the dependent variable.

Multivariate Regression Analysis

Multiple regression offers analysts one of the most powerful and useful tools for quantitative analysis. With the exception of descriptive statistics, it is the most widely used quantitative method. There are three primary reasons for its popularity. First, it is accessible. Regression analysis is relatively easy to use and understand, and estimation software is widely available. Second, the multivariate linear specification is robust. Many relationships have been found empirically to be linear. The linear specification is the simplest, and thus always appropriate as a first approximation of a causal relationship. Moreover, we often do not know enough about the relationship under study to justify an alternative (nonlinear) specification. Third, the results of regression analysis have proven to be very useful, both for predicting or forecasting and for explanation (i.e., determining the causes of a phenomenon). It is the ability of multivariate regression to control for confounding influences on the relationship under study that makes it a particularly powerful tool of explanation.

Multiple regression has been used to explore a wide range of phenomena in public administration and public policy. Given its power and usefulness as a methodology and the broad range of public sector issues about which it has provided insight, consider what regression analysis is and how one can effectively use it. Assume we want to quantitatively analyze a relationship between two or more variables. We need a set of observations for each variable, and a hypothesis setting forth the explicit form of the relationship. The set of observations, a *sample*, is chosen from the population of interest. The variable we wish to explore is called the *dependent* variable (denoted Y). The variables that are believed to cause or influence Y are called *independent* variables (denoted as X s). The model we aim to explore is a multivariate linear relationship between X and Y .

$$Y = a + b_1 X_1 + b_2 X_2 + \dots + b_p X_p$$

Where, Y denotes the dependent variable, X denotes the independent variables

The regression line expresses the best prediction of the dependent variable (Y), given the independent variables (X). However, nature is rarely (if ever) perfectly predictable, and usually there is substantial variation of

the observed points around the fitted regression line. The deviation of a particular point from the regression line (its predicted value) is called the *residual* value.

R-Square, also known as the *Coefficient of determination* is a commonly used statistic to evaluate model fit. *R-square* is 1 minus the *ratio of residual variability*. When the variability of the residual values around the regression line relative to the overall variability is small, the predictions from the regression equation are good. For example, if there is no relationship between the X and Y variables, then the *ratio of the residual variability* of the Y variable to the original variance is equal to 1.0. Then R-square would be 0. If X and Y are perfectly related then there is no residual variance and the ratio of variance would be 0.0, making R-square = 1. In most cases, the ratio and *R-square* will fall somewhere between these extremes, that is, between 0.0 and 1.0. This ratio value is immediately interpretable in the following manner. If we have an *R-square* of 0.4 then we know that the variability of the Y values around the regression line is 1-0.4 times the original variance; in other words we have explained 40% of the original variability, and are left with 60% residual variability. Ideally, we would like to explain most if not all of the original variability. The *R-square* value is an indicator of how well the model fits the data (e.g., an *R-square* close to 1.0 indicates that we have accounted for almost all of the variability with the variables specified in the model),

3. Interpretation and Drawing Inferences

Even researchers who carefully planned their studies and collected, managed, Mini analyzed their data with the highest integrity might still make mistakes when interpreting their data. Following are some of the most critical issues to consider when interpreting data and drawing inferences of any research findings.

Statistical power: One of the ways that study findings can be misinterpreted is through insufficient statistical power. In simple terms, *statistical power* is a measure of the probability that a statistical test will reject a false null hypothesis, or in other words, the probability of finding a significant result when there really is one. The higher the power of a statistical test, the more likely one is to find statistical significance if the null hypothesis is actually false (i.e., if there really is an effect). Statistical power is largely determined by three factors: (1) the significance criterion (e.g., .05, .01); (2) the *effect size* (i.e., the magnitude of the differences between group means or other test statistics); and (3) the size of the sample.

Characteristics of the distribution: Another factor that can lead to faulty interpretations of statistical findings is the failure to consider the characteristics of the distribution. Virtually all statistical tests have certain basic assumptions. For example, *parametric tests* (e.g., f-tests, ANOVA, linear regression) require that the distribution of data meet, certain requirements (i.e., normality and independence). Failure to meet these assumptions may cause the results of an analysis to be inaccurate. Although statistics such as the t -test and ANOVA are considered relatively robust in terms of their sensitivity to normality, this is less true for the assumption of independence.

Reliability and Validity of measurement: Another major factor that can affect a study's findings is measurement error. Although most statistical analyses, and many of the researchers who conduct them, assume that assessment instruments are error free, this is usually far from the truth. In fact, assessment instruments are rarely, if ever, perfect. This is particularly true when using un-standardized measures that may vary in their administration procedures, or when using instruments that have little if any demonstrated validity or reliability using error-laden instruments may substantially reduce the sensitivity of your analyses and obscure otherwise significant findings.

Statistical Significance vs. Clinical Significance: Because of the technical and detailed nature of the research, it is often easy to miss the forest for the trees. Researchers can get so caught up in the rigor of data collection, management, and analysis that they may wind up believing that the final value of a research study lies in its p -value. This is, of course, far from the truth. The real value of a research finding lies in its *clinical significance*, not in its statistical significance. In other words, will the researching findings affect how things are done in the real world? This is not to say that statistical significance is irrelevant. On the contrary, statistical significance is essential in determining how likely a result is to be true or due to chance. Before we can decide on the clinical significance of a finding, we must be somewhat certain that the finding is indeed valid. The misperception instead lies in the belief that statistical significance itself is meaningful. In fact, study results can be statistically significant, but clinically meaningless.

Confusing of Correlation with Causation: Researchers have to be extra cautious and note that correlation is *not necessarily* causation. Significant or not, hypothesized or not, large-magnitude associations or not, simple

measures of association should never be interpreted as demonstrating causal relationships.

Significance or Non-significance: The last point that needs to be looked into is the interpretation of results is the issue of non-significance. It is generally assumed that non-significant results are not useful. On the contrary, non-significant findings can be as important, if not more important, than significant ones. The furtherance of science depends on attempts to replicate research findings and to determine whether findings found in one-population generalize to other populations. In any of these cases, non-significant findings can have some very significant and important implications. Therefore, it is strongly recommended that researchers be as neutral and objective as possible when analyzing and interpreting their results.

Construction of Tables

Whatever data is obtained must be tabulated or put into tables before being used for further analysis. Tabulation is an in between process of the collection of data and the final processed results shown by the statistics.

In order to reach the target audience and to give them a precise and clear understanding, it is indeed very important to arrange and present data in a certain logical and concise manner. The assembled data are usually processed by arranging the observed values against the selected variables.

Tabulation begins with the identification of a classification system. Criteria for such classifications are determined by the research problem under study as well as by such characteristic features of data and the type of scale of measurement like nominal, ordinal, interval, or ratio to be used to quantify different frequencies in different categories.

In constructing a table, two types of variables namely continuous and discrete variables are used. A distinction is usually made between continuous and discrete variables. A continuous variable has an unlimited number of possible values ranging between the lowest and the highest, while a discrete variable can have any of a series of specified values but has no possibility of variate values between these points. Each value of a discrete variable is distinct and separate, whereas the values of a continuous variable merge into one another by minute gradations. Age, weight, and temperature are examples of [Continuous variables. People, houses and automobiles are examples of discrete variables.

However, in practice, all variables are usually treated as discrete units. Depending on situation continuous variables are stated in some discrete units. As for example, although length is supposedly a continuous variable, but in actual practice it is presented in discrete units to an inch, feet or yards or any other given length unit.

Determination of class interval is another important consideration of constructing a table. Class interval is the distance or gap between the value of the upper limit and the lower limit of the variable under observation. Class intervals are generally indicated by the first and last number of the interval. For statistical purpose it is desirable to have class intervals of uniform size. Ideally the class intervals should not be too small as to lose the advantages of summarization or quite large as to hide the concentration and important characteristics of a distribution. In case of comparison between similar data, it is advisable to select class intervals of the same size for all distributions. Whenever possible, class intervals should represent common and convenient numerical divisions such as 10 or 20, rather than odd divisions such as 3 or 7.

Class intervals should be so designated that it eliminates the possibility of misinterpretation or confusion. Say for example, a researcher wants to show the distribution of the age group of certain population with the age groups of 0-20, 21-50 and 51 and above. It might turn out to be confusing if the researcher proposes to use intervals of 0-20, 20-50 and so on. It shows an overlapping of numbers. In such cases however, the observations with the values falling on the upper-end limit of a class-interval are conventionally placed in the next class-interval e.g. the observations with a value of 20 will be included in the class 20-30. In such case it is called a lower limit inclusive class. While the researcher may choose to do the reverse where 20 could be placed in 0-20 class if he wishes to make it an upper limit inclusive class. Whatever is the type of inclusion of the limit, it is customary that the researcher mentions it at the bottom of the table.

In case of continuous variables, utmost care has to be taken to distinguish between the expressed and the actual limits of the class interval. The actual distance of class interval depends basically upon the accuracy of measurement of data. If measures are carried to two decimal places, the actual limits, say as an interval of ten, would be 0.00 to 9.99.

On the other hand, the class intervals in discrete numbers are self-evident. Since a single unit determines the limits of class intervals, in case of discrete numbers, class intervals are arranged in either ascending or descending order of magnitude.

Frequency distribution is one of the most important steps in designing a table. Frequency distribution provides useful insights into the nature of data and guides the researcher in determining the number of categories of variables. As a standard it is advisable that the frequency distribution categories remain between 5 to 10. The researcher needs to thoroughly examine the categories of frequency distribution. He keeps on merging and dissecting the appropriate categories of each variable until he is satisfied with the adequacy of frequencies in each class or group.

Data can be expressed in several forms. One may use simple or cumulative frequency distribution, or can transform the frequencies into proportions, percentages or ratios as the condition of expression demands. For further comparison between two or more variables cross tabulation table could also be prepared.

There are in fact different ways of presenting data. Data can be presented in the form of tables, graphs or other pictorial modes to expedite the understanding of their salient features by the targeted audience. Whatever may be the mode of the presentation of data there are some guiding principles in this regard. Shah (1977) has identified some of these:

- i. Data must be presented in a meaningful way. The sequence of tables and charts must correspond to a logical sequence of analysis and interpretation of the data. Tables should be identified by a serial number to facilitate-easy reference.
- ii. Presentation of data must be geared to facilitate their understanding by the readers. Tables and charts must, therefore, be as simple and unambiguous as possible. The title, row and column headings may be brief but must be self-explanatory. The title and other headings should make the table or chart legible without any reference to the text. The units of measurement employed must be clearly shown and sufficient care should be taken to align figures under appropriate rows or columns. Similarly, adequate space between rows and columns must be provided to avoid any confusion. Sometimes, the columns and rows may be numbered to facilitate reading.
- iii. All relevant information must be appropriately given. Approximations and omissions may be explained in footnotes, together with information about miscellaneous items and changes in methods of measurement or sources of data. Footnotes concerning a table must be marked with appropriate reference symbols (*,+ , etc.) and given directly beneath the table.

Types of Table

There are at least five different types of table. Following is a brief discussion reach types of the tables (Thirkcttle;1974):

Informative tables : These are original tables which contain systematically arranged data compiled for record and further use, without any intention of presenting comparisons, relationships or the significance of the figures. In other words, they merely provide a convenient means of compiling data in a form of easy reference, mostly in chronological order. This type of table is frequently referred as a *schedule*.

Text or Summary tables: These tables are used to analyze or to assist the analysis of classified data. They show only the relevant data of the question being discussed. Ratios, percentage, averages and other computed measures are often added. If included in a report they are often found in the body of the text. These tables are interpretive or derivative tables, in that they are analytical and prepared to present significant aspects of data.

Simple tables : A simple table presents the number or measurement of a single set of items having the characteristics stated at the head of a column or row which forms the basis of the table. Following is an example of a simple table.

Table 1 : Income of Rural Household of Village Niamatnagar

Income in Taka	No of Household
1000 – 2000	19
2000 - 3000	23
3000 – 4000	9
4000 – 5000	6
5000 – 6000	3
Total	60

Complex table: A complex table presents the number or measurement of more than one group of items set out in additional columns or rows, and the table is often divided into sections. Such tables generally show the relationship of one set of data to another and are often so arranged that comparisons can be made between related facts. Following is an example of a complex table.

Table 2 : Distributor of Employees in Nischintapur Cooperative

Age	Administration			Marketing			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
20-25	3	1	4	6	1	7	9	2	11
25-30	5	0	5	7	3	10	12	3	15
30-35	0	0	0	1	1	2	1	1	2
35-40	1	0	1	2	0	2	3	0	3
Total	9	1	10	16	5	21	25	6	31

General or reference tables: These tables contain a great deal of summarized information. General purpose tables are also known as original, primary, or reference tables. A general purpose table is designed to include large amounts of source data in a convenient and accessible form. These are not used for analytical purposes and usually do not give averages, ratios or any other computed measures. If they are embodied in a report they are usually relegated to an appendix. These are often considered as source from which summary tables are compiled.

Special Purpose tables: Special purpose tables are also referred to as presentation, analytical, summary, interpretative, derivative, or secondary tables. A special purpose table is often developed from a general purpose table and is included in the body or text of the report. It usually presents selected or summary data and aims to illustrate some significant points or emphasize significant relationships in the data. The data of a special purpose table may be grouped, averaged, rounded, derived or handled in any legitimate manner so as to serve the special functions of clarification and emphasis.

Format of a Table

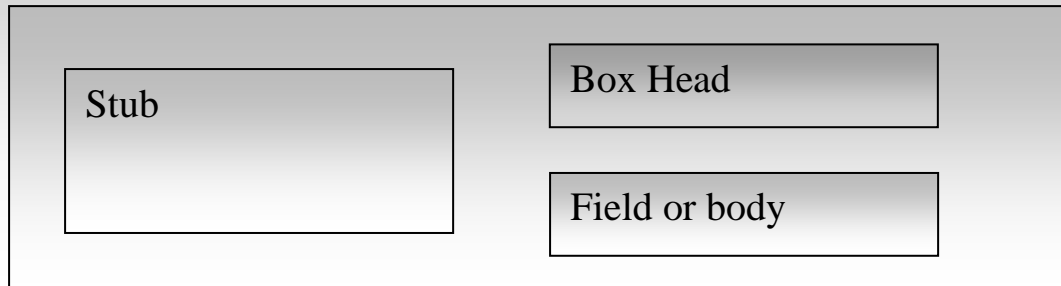
A table is a systematic presentation of data distributed and arranged in line with the dependent and independent variables. Normally as a rule of thumb, the independent variable is placed on the left hand side while the “dependent” variable is shown on the right hand side. However, the terms "independent", "dependent", and "control" variables are defined in a relative sense and not absolutely.

Drawing a table is not that easy as it appears to be. Researchers try out various alternative ways to prepare the format of a table. It is essential to see that the row as well as the column categories are logically consistent, parallel in phrasing and meaning, mutually exclusive, all-inclusive, and clearly defined. The major components of a table are identified as below:

Figure 8.3: Components of a Table

Table Number: Title of the Table

(Head Notes, if necessary)



Footnote; if necessary, and sources Source:

While presenting a table, a number in consecutive serials must be assigned to each of the tables. Tables attached as appendix should also be numbered.

The title of the table should be very brief. Titles should also indicate broadly the contents of the table, that is, whether the figures in the table indicate frequency counts, percentages, proportions, or means etc.; identification of the sample/ production; and major variables in terms of which the observations are classified. If the supportive information is quite elaborate then a head note should be added to supplement the additional information.

Boxhead incorporates headings of all of the columns in the table. The boxhead can be appropriately subdivided into sub-heads indicating different variables, which can be further sub-divided into columns. The total figures should be given in the extreme right hand column.

Stub head is composed of the headings of all rows in the table. In order to accommodate different variables, the stub head is also suitably subdivided into sub-heads. These can further be sub-divided into rows. The total figures should be shown in the bottom row. All sub-classifications should be subsumed under the inclusive headings.

Field or body refers to the cells in a table. Finally the footnotes are used to indicate sources of data, levels of significance, etc.

Table 3 : Post High Schools Educational Aspirations of S.S.C Students by Sex

Level of Educational Aspiration	Male (%)	Female (%)	Total (%)
No further education	3.7	6.0	4.6
Some vocational training	7.8	4.5	6.6
Some college education	12.2	23.3	16.3
College Graduation	75.1	64.0	71.0
Not Available	1.2	2.2	1.5
TOTAL (%)	100.0	100.0	100.0
(N)	3283	1918	5201

* *The chi-square for the sex difference in this table is significant at the 0.0001 level. Source: Shah; 1977;p. 118*

Table 4 : Percentage Distribution of Students' Aspiration

Socio economic	Males		Females	
	Academic Performance		Academic Performance	
	Low	High	Low	High
Low	57.0 (965)	75.4 (940)	35.0 (452)	56.6 (274)
High	80.0 (614)	93.7 (764)	67.1 (595)	86.3 (597)

The chi-square value for each column in this table is significant at 0.000! level.

The row and column headings should ordinarily be general para- phrases or descriptions of responses rather than attempts to catch particular wordings used by respondents. They should indicate as precisely as possible what the figures in the respective columns or rows indicate.

As a rule, every table must indicate the number of observations upon which the percentages or any other statistical functions are made. Number of observations should be shown both for the respective columns or rows.

For further analysis and understanding some researchers provide the chi-square value, degrees of freedom, and p value in the table. These statistics should only be given when a significant relationship is observed at a given level of statistical significance.

Table 3 is an example of a two-dimensional or bivariate table. The entries of the Table 3 are arranged according to two variables (level of educational aspirations and sex). If, however, the entries under the column heading

marked 'Males' and 'Females' are eliminated - the table will become one-dimensional or univariate table.

Table 4 is an example of a four-dimensional table in which the data are classified according to socio-economic status, academic performance, sex and aspirations to a college degree.

One can produce a multi-dimensional table by just adding more classificatory variables. However, the researcher should bear in mind that multi-dimensional tables generally confuse the readers. The multidimensional tables are useful in analyzing complex and inter-related problems and distribution. However, if the independent and control variables are further classified it become quite difficult to critically examine the distribution of the observations and the size of the table get enormously big causing problems of presentation and typing in regular size paper.

Problems in Data Interpretation

In most cases due to the practical limitations, data tend to be collected rather haphazardly. It is also not always possible to collect data in a predetermined mode. The researcher has to make all types of adjustment during data collection stage. The researcher may get the data from one source at a time even though the data may be destined for use in answering six or seven separate research questions. The research therefore is left with incomplete data to answer and analyze any one of the questions. Analysis with incomplete set of data may lead to misleading and invalid conclusions.

There is yet another problem, if the researcher thinks that the data as it starts to come in, he may find himself redesigning his research before he may find himself redesigning his research before he has all the results. This happens frequently in almost all research situations. If a series of interviews starts to suggest that the original research was just a bit off target, the interview questions will be changed. The problem is of course that the preliminary results may not be valid, and any change based on them can invalidate the rest of the research findings and conclusions (Monroe;1980:183).

There is a tendency to build interpretation to take initial results and draw conclusions from them and then to look for the same sort of results as mote data come in.

Triangulation and Integration of Qualitative and Quantitative Methods

Researchers use various methods of research tools and approaches both quantitative as well as qualitative in social research and inquire. However during research analysis and interpretation, the qualitative and quantitative data can be interpreted simultaneously in an integrated fashion. Such integration of various types of data in its simplest term called *triangulation*

of data and I information. (Erzberger and Prein, 1997, Kelle and Erzberger, 1999)

Triangulation of data can help the researcher to see :

- Whether the qualitative and quantitative results have any tendency of *convergence*. In such case the results lead to the same conclusions,
- Whether the qualitative and quantitative results are *complementary* or *supplement* each other,
- Whether qualitative and quantitative results indicate *divergent* or *contradictory* trends.

Example of Triangulation

Dummy Chapter

Access to Public Service Delivery System and

Intensity of Poverty

This chapter attempts to examine the relationship between access to public service delivery system and its impact on incidences of poverty. The chapter aims at arguing that poverty and access to, and quality of public service delivery system are significantly related. The chapter further argues that poverty should not be seen merely as the "lack of purchasing power", "world view" or attitude or "mind set" (Blackburn, 1994) but be recognized as "capacity failure theory of the state" (Paul, 1991:45), where critical factor like public service delivery system can play a significant role.

Content/Discourse Analysis

Theories on poverty have presented different approaches to understand poverty and its intensity in various socio-cultural settings (Blackwood and Lynch, 1994:567). One of such theoretical approaches is based on the assumptions that failure of timely, adequate and quality public services especially in terms of health, education, food and communication can cause severe poverty of pockets even in a relatively stable economy ((Ghafur, 1998:34). Aminuzzaman (2006:176) empirically validated that access to and consumption of essential social services are far too limited for the marginal and extreme poor. Which, in turn, perpetually influence the intensity of poverty and disempowerment in rural poor of Bangladesh. Similar observations are also empirically validated in the context of Tanzania and Uganda (Landes, 1998:89)

Survey Data

In line with the major research questions, a sample survey was carried out in the *Char* lands of Kurigram district. Empirical data gathered from the survey are presented below:

Table 5: Access to formal Health Delivery System in Selected Poverty Pocket Villages in Char lands in Bangladesh (n=325)

Income Group	Rare/None	Occasionally	Regularly
Very Low	84%	15%	1%
Low	74%	22%	4%
Mid	24%	60%	16%
Upper Mid	0%	32%	68%

Source: Field level Survey Data, 2009,

Chi square value: 328 at 3 degree of freedom

The above table clearly reveals that the lower the income group lesser the access to formal health delivery system. The Chi-square result also shows that the relationships are also statistically highly significant (*This can be expanded with elaboration of the table to further augment the researcher's position*)

Case Study

To further examine and validate the survey data, few case studies have been undertaken in the selected *Char* areas of Chilmari Upazila of Kurigram. One case study is presented below:

Surat AH is a day laborer in *Manushmara Char* at Rajibpur Union of Chilmari Upazila. He earns on average Tk 50 to 60 per day and has six mouths to feed. He has four children and all are under the age of 10. None of them goes to school, as there is no primary school in the *Char*. There is a school in the nearby *Char* - which takes Tk 1 to travel by boat during the dry season and Tk 3 during the monsoon. His mother is above 70 and suffering from chronic asthma. All four children appear to be suffering from malnutrition, one found to be suffering from pneumonia and other respiratory track diseases. Two of his children died before the age of three from diarrhoeal and gastronomical diseases. None of the family members has ever got an opportunity to be treated by a doctor. Ali also suffers from seasonal asthma attacks, which usually costs him 10 to 20 wage days every winter. As the only wage earner he usually borrows money from the local money lender with high interest. His accumulated borrowing is about Tk 5500, which is equivalent to his 3.5 months wage income.....

The case study reveals that a typical *Char* dweller is:

- a. extremely poor with almost no access to basic services (specially health and education),
- b. has a very low wage earning and is thereby heavily indebted.

Interviews

The researcher also attempted to tap the opinions and observations of some of the key informants to explore the ground reality and validate the tentative hypotheses of the study. The key informants included local government representatives, extension workers of different line ministries of the government and NGO field workers.

Following are some of the key observations drawn from the interviews:

A Local UP Chairman noted:

"Usually a poor day laborer losses one month of income due to seasonal diseases and gets into the trap of loan from traditional money lender. He therefore can hardly travel to the nearest service facilities."

Agricultural Extension Workers described the situation as:

"Most of the diseases of the poor peasants could be cured had they got the opportunity to be treated even by a Para-medic let alone by a professional doctor. Lack of education and awareness also takes toll on their health and subsequently on income."

NGO Extension Workers observed:

"Every season on average 60 percent of our micro credit borrowers fail to repay their dues in time because of illness. This further put them in pressure to adjust the repayment schedule. A good number of them become defaulters and are dropped out from the program."

Now the researcher may draw his/her conclusions for the chapter on the basis of the findings of the above research methods:

- Content Analysis: What have you learnt or gathered from different studies/ secondary materials?
- Survey Data: What are the prime findings being generated from the survey?
- Case Studies: What are the major observations/inferences that you can draw in line with your arguments/hypotheses/research questions?
- Interviews: How do the interview findings supplement your prime argument?

Conclusions

- Take note that the conclusions should be in line with the opening statement of the chapter.
- Should be based on the data/information that the researcher has gathered.
- The researcher should try to link the data/information from all the sources to address the prime research questions.

CHAPTER

9

Reporting
Research

Reporting Research

Reporting is the terminal and most important step in research Endeavor. 'I lie ultimate achievement or failure of a research to a great extent, depends on how well the research has been reported. Although the researcher might have used n highly sophisticated theoretical framework and deduced exceptionally pragmatic hypotheses, and very carefully designed the sample framework and have generated outstanding findings, yet all these will be of little significant unless these are appropriately reported.

The dictionary defines a report as "a formal statement of the results of an investigation or of any matter on which definite information is required, made by some person or body, instructed or required to do so."

The report is, therefore, a document in which a given problem is examined lot the purpose of conveying information, reporting findings, putting forward ideas and sometimes making recommendations.

A report serves two purposes; first, it provides a permanent, comprehensive and coherent account of an investigation, study or piece of research; second, it provides information which is required for future reference, decision and policy making activities. A report is, therefore, a definite document and the end product of an exercise.

The style of presentation of a report will depend on who is the researcher, what are his immediate and long-term objectives, and who are the likely consumers of his research. The form and style of presentation of a research report therefore depends to a great extent on the target audience of the research report. Considering the above criteria three broad categories of target audience could be identified:

i The Academic Community

If a student working for a Masters or Ph.D. degree and writing a thesis based on his research, the members of his thesis committee become his target audience. Therefore, the form and style of his research report must be consistent with the norms and requirements of his department or the university.

ii The Sponsors of Research

If a person working in a research institution or a university is expected to provide a report of submission to the funding agency, the sponsors of the research become his target audience. Whether these sponsors are working in an industrial, government or other organization, their needs are somewhat different from those of an academic community; the form of his research report will, therefore, need to be tailored according to the sponsor's objectives in applying the research findings.

iii. The General Public

If the researcher is interested to disseminate the findings of his research work for the consumption of general public then the target audience would be the cross section of the people.

Based on the above consideration, one can categorize research reports into three broad categories: a. A comprehensive research report/monograph/thesis/dissertation; b. Professional and consultative research reports/articles; and c. Popular interest research papers. Each of these may be tailored for the consumption of any of the three major categories of target audience.

It is difficult and usually not even desirable to attempt to write on multipurpose report that is aimed at different target audiences. It is distressing to read a report that appears now to be directed to general public, then to an academic community, and still further on to the administrators of a sponsoring agency. Such multipurpose reports rarely have much success.

The most useful approach is to choose and write for a single target audience, level appropriate to it. Any additional matter intended for other audiences may be in cloud only if it does not interfere with the communication of the research finding to the target audience.

Steps in Report Writing

Writing research report is much more an art than a matter of rule. Report writing is a specialized form of written communication. However, many of such rules which must be observed when writing a report are, therefore, equally applicable to written communications in general.

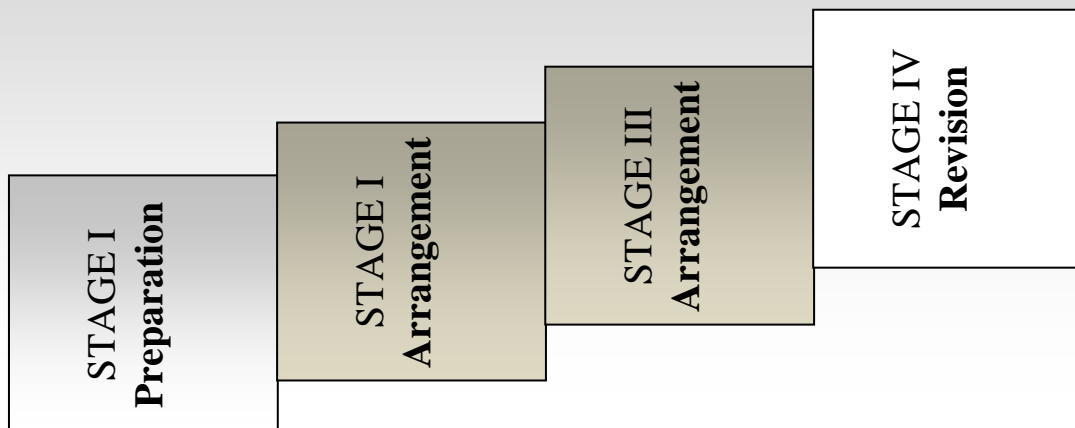
Report writing maintains a four step cycle of: i. preparation; ii. arrangement; iii. writing; and iv. revision.

Stage 1: Preparation: The first step of this stage is to set a clear purpose of the report. At this stage researcher has to find out exactly what he

has been asked to do. In other words, the researcher tries to get concise terms of reference and establish clearly in his mind the subject, scope and purpose of the report. The purpose will generally be a combination of some or all of the following:

- To give information, either detailed or general.
- To report findings;
- To put forward ideas;
- To recommend a course of action.
- The next consideration in report writing is the reader of the report. The researcher should be guided by the following questions:
- What does the reader want to know from this report?
- What does the reader know already?

Figure 9.1 Stages in Report Writing



- How can new knowledge be grafted on the reader's existing knowledge?
- What kind of terminology will the reader understand?
- How will the reader use the report?

Third and final step of this stage is to organize the materials Researched data, facts and ideas about the subject of research have in be carefully checked for accuracy and authenticity.

The researcher should jot down all his facts and ideas and record them in note form. Any order may be followed at this stage, ;is circumstances dictate. If any major divisions of the subjects HIV obvious, a separate page or index card could be used for each of them For instance, an organization analysis subject may divide itscll naturally into the technical, financial, labor and administrative aspects.

Stage II: Arrangement. At this stage observance of the following points usually helps the research to construct a concise, logical and well arranged report.

Writing down the purpose of the research in one terse sentence. This will test the researcher's **understanding** of his task and deter him from including unnecessary points. After this a title should be chosen to make the purpose plain.

Examining the collected facts and ideas. At this step researcher should reject any data or information which on second thought are neither helpful nor necessary for the research purpose. Additional notes on any other topics and issues should be taken which now appear to be essential or desirable.

Reviewing the major sections critically. If the researcher could not make groupings earlier, main divisions of the report must be considered at this stage. An appropriate section heading has to be chosen. Each heading should be written on a separate sheet of paper or index card, and the thematic items, data and fact sheets should be listed under each appropriate heading.

Deciding the order in which the main divisions will be presented. This will form the sections of the report. Each section headings should be numbered so that they can be referred to in any discussion of the report.

Arrangement of materials in an order which the readers will easily follow. The readers should be led step by step from known to the unknown. Careful presentation of materials to a great extent, clarifies the complex subject.

Conclusions and recommendations should be square with the facts. The researcher at the outset should decide whether to group the conclusions and recommendations in a section of their own which form a natural conclusion to the report, or distribute them among the sections to which they belong. One may use methods,

stating the conclusions and recommendations section by section, and re-stating them with cumulative force in the conclusion.

Title and section headings. The titles should identify and not merely describe the subject matters under them. Brevity is desirable, but three or four precise, informative words are better than the vague ambiguous ones.

Illustration to supplement or replace words. A good diagram is often worth more than a page of writing. Following are some suggestions concerning the form that illustrations can take.

Photographs are vivid and carry conviction. They serve as substantiation and proof, and they are an aid in visualizing.

Diagrams illustrate complicated ideas clearly and quickly. They show relationship between parts. Sometimes they can illustrate principles.

Tables of figures, words or both are used primarily for presenting statistics. They may emphasize tendencies, allow for comparisons mid aid the mind to organize data. However, some tables could be used as appendix to avoid cluttering up and confusing the main text with figures.

Charts are the effective alternative to tables. Charts may show comparisons between quantities in various ways, like:

- i. bars of different lengths;
- ii. circles/pic or other shapes divided by sectors;
- iii. symbolical representations, such as lines of sacks representing a country's export or production. Other types are organization charts, which show the functions of, and relationships between, members of an organization, and flow charts, which show schematically the sequences of operations or process.

Graphs are more strictly scientific alternative to charts, when trends, fluctuations, or comparisons between quantities have to be shown.

Captions, titles and other wordings should be brief, with enough background space to avoid any sense of crowding. But everything that is not obvious must be identified and explained.

Use of Footnotes. Footnotes should be used in such a manner that they do not impede the flow of the text and or the narrative arguments. The footnotes should be used to:

- give sources of quotations or references mentioned in the text;
- indicate authorities or sources of additional information;
- explain passages in the text which may be clear to some readers but not to others.

Footnotes should be as brief as possible. They should appear on the same page as the text to which they refer. If that are used only in isolated instances, an asterisk (*) may be appropriate. Otherwise footnotes should be numbered consecutively, beginning on each page with 1.

Appendices. The researcher may consider lifting any factual details out of the main body of the report and placing them in appendices. Appendices perform functions similar to those of footnotes by removing distracting details and thus enabling the reader to follow the main line of thought without interruption.

Stage III : Writing. At this stage the researcher must decide what should be the tone of the text and the general style of presentation. It is not always necessary to write impersonally but the writer must always check to ensure that there is no inappropriate subjectivity or partiality. Even when opinions are presented, these should be supplied in an informed and balanced way. Researchers should be guided by the assumption that the recipients of the reports have a developed sense for detecting unfairness, biased selection or partiality. Style should be lucid, businesslike and balanced exposition is usually desired in professional research reports.

Arrangement. The reports should always be user oriented. Each sections and paragraph within, should be numbered or be given a letter. Any number or lettering scheme must be maintained consistently and must be set out on the page so that it is clearly subordinate to the section numbering. One can use Roman numerals for section headings, and Arabic numbers and *italic* letters within section.

Layout. The layout of a report is very important. It shapes the attitude of the person(s) who will read it.

- i. Numbering : The researcher, should try to help readers by numbering or lettering parts within the various sections. Once a pattern is chosen, it should not vary. It would, for example, be possible to use *Roman* numerals for section headings and *Arabic* numbers and or *italic*

letters within the section. In many conventional client oriented reports, paragraphs are numbered consecutively from introduction through to final summary. This numbering system is independent of any division of the report into sections, chapters or parts.

- ii. Presentation: In presenting the report, the writer should be generous with space. Wide margins and double-spaced type with prominent headings should be used.

Illustration: Reading matters and visual items must be closely linked. Every illustration should be referred to at least once in the text and should be accompanied by an identification caption or title. If there are more than two or three illustrations it may be advisable to number them for reference.

Following is a comprehensive checklist that could be used to correct errors of fact, presentation and style of a report:

- i. Facts: Beware of:
 - a. Misstatement, exaggeration, misinterpretation or omission of facts.
 - b. Failure to distinguish between fact and opinion.
 - c. Contradiction and inconsistencies.
 - d. Conclusion unwarranted by evidence.
- ii. Presentation: Beware of:
 - a. Omission of matters important to the chain of thought.
 - b. Inclusion of material in wrong section or paragraph.
 - c. Failure to open each paragraph with a telling sentence clearly related to the theme of the paragraph.
 - d. Inconsistency in layout and presentation.
 - e. Inclusion of irrelevant or tedious details.
 - f. Failure to distinguish between new knowledge and what is already well known.
- iii. Style: Beware of:
 - a. Long sentences, long paragraphs and complicated grammar. Use common sense in dealing with punctuation marks. Avoid sentences that require re-reading before their meaning can be grasped.

- b. Successive statements that suggest an unintended and perhaps ludicrous relationship. For example : "Mr. Ahmed was absent. The meeting was a success".
- c. The use and omission of such useful relation-words as "however" "moreover" "on the other hand" especially in short sentences.
- d. Wordiness and padding - failure to come to the point.
- e. Needless technical language, and sentences overloaded with unfamiliar words. The social sciences have a legacy of inadvertently using terms that may have slight different shades of meanings in the common usage and their technical usage. As a rule scientific terms must be adequately defined and used consistently.
- f. Adequate attention to the correct use of grammar and to the correct spelling. As far as possible use present tense. When a report must refer to past tense frequently it is best to write entirely in the past tense so as to avoid confusing shifts from past to present.

Once the first inertia of writing has been overcome, writing should continue from point to point in the sequence planned ahead. At the drafting stage one need not be critical or worried about the delicacy of grammar or of (he formal and style of report which is subject to revision.

Stage IV: Revision. When the first draft of the report is complete, it should be kept aside for a day or two, if time permits. Then the report is to be read with very critical views and with objectivity as if the report is the work of another author. Following should be the check list for the revision of a report:

- a. Make a cursory examination of the draft as a whole. Is the design of the report consistent with the purpose of the research?
- b. Consider the Title, Table of Contents, Introduction and Conclusion in relation to one another. Have the subject, purpose and plan of the study clearly stated in the introduction? Do the headings agree with the Table of Contents and with the plan announced in the introduction? Has the emphasis been placed on the correct points? Are the parts in agreement with, and in proportion to, one another?
- c. Every statement should critically be examined especially if it is liable to be quoted out of its context.

- d. Read the text aloud or preferably to somebody else. Are there any tiresome repetitions?
- e. Check the illustrations. Does each of the illustration convey its message clearly? Is the association between text and illustrations as clear and as close as possible? Are the options precise and informative?
- f. If possible the draft report be submitted to a person qualified to give constructive comments and criticism.

The form, contents and style of reporting will determine how the process of diffusing the research experiences to the community at large will be set in motion. For a successful communication of research experiences, we need to consider some basic questions which determine the effectiveness of communication, namely, who says what to whom in what way and with what effect.

The first consideration in the art of report writing is to determine the target audience. The process of communication requires some definition of the writer and the reader.

The form, language and style of a report assume considerable importance insofar as it is geared to facilitate the understanding and grasping of its contents by the reader. In reporting research based on statistical data, tables and their pictorial presentation are useful tools for communicating the data collected in research. And finally, the importance of any piece of research hinges on the ways which its findings are discussed and interpreted.

General Format of a Research Report

The following may be suggested as a broad sequence of contents in a research report:

Title page

The title of the research report should be clear, concise and indicative of its contents. It should bear the name and full identification of the author or authors and the date. If the report is to be confidential, or subject in copyright, this must be clearly stated.

Foreword

Usually a foreword of about half a page to a page provide a very brief statement of the problem, objectives, agency sponsoring the study, and like. It may be written either by the person who conducted the research, or

by the head of the research organization, or by someone representing the agency sponsoring the research.

Abstract

A short two pages or so summary of the overall report should be prepared. One way of producing the abstract is to describe in one paragraph each major section of the report.

Table of contents

Some people may wish to read the main headings without going right through the report. The purpose of a table of contents is to enable the readers to identify the parts of the report and to see the relationships of the parts to one another. It should indicate the title of each chapter, section and sub-section along with its page numbers. It should also present the list of tables, charts, illustrations, figures, appendices, bibliography. In long reports, the list of contents may take on the form of an index so that the reader does not wander aimlessly looking for key information. A table of content therefore, provides a mirror view of the contents of the report. The table of contents may be compiled as follows:

- a. the numbered sections and sub-sections headings;
- b. indicate the relationship between headings and sub-headings by indentation;
- c. add separate list of tables and illustrations if necessary;

Introduction

Every report need to be presented through an introduction. In this section the researcher should briefly introduce the readers to the research problem, its scope, its theoretical and practical importance, and the manner in which he has attempted to find answers to the research questions. Sometimes the introduction may also contain a brief narration about the organization of the material in the report.

The introduction is a place for a broad, general view of the materials presented. But details should be avoided which belong properly to the main sections. Introduction should be made as interesting as possible but one has to be aware of sensationalism or distortion of fact. In the introduction followings should be included :

- a clear definition of the subject and broad indication of its scope, composition and significance;

- b. statement of the purpose and the terms of reference, and the indication how far the researcher have been able to carry them out;
- c. provide background information such as the sequences of past events leading to a present problem which the reader will need and which the reader may or may not know or clearly remember;
- d. statement of the summarized version of the results, major findings, conclusions and recommendations;
- e. an idea about the arrangement of the report in terms of the main sections; and
- f. definition of the technical terms, and words that the researcher intends to use in a special sense.

Main Sections or the body

While writing the report concentration should be given to one section at a time. One needs to do some or all of the following in each section:

- a. State facts obtained and indicate sources.
- b. Analyze these facts.
- c. State the conclusions based on them.
- d. Describe the procedures followed in the investigations.
- e. Refer to or summarize, matter fully presented in an appendix.

i. Review of Literature

This section of the report attempts to present the major observations or findings that have been drawn by other researcher who have done similar or related research. This section of the report highlights the shortcoming and the methodological treatments of the reviewed research works. This section also conclusively identifies the distinction of the current research from other research work that is already done in this area. Review of literature however does not always form the part of the report, particularly if the report is for a business client.

ii. Identification, Selection, and Formulation of the Problem

In this section the researcher attempts to explain why and how the broad area of research has been identified and tackled in the study. Was n because of the concern of the sponsors that the researcher took up llir research problem as suggested by them? Was he concerned about tin-pressing practical problems? Did he plan to test some hunches, notions 01 hypotheses suggested by others - do these have relevance to theory'/ Did he set out to fill up some gaps in knowledge or theory, or to look lot additional

tests of theory which might have been supported by others using, different samples and techniques? Was he interested in extending the¹ irrelevance of some past findings or theories to new areas? Was the study a replication of some other studies with certain modifications? Was he concerned about developing a new technique of research and analysis? The answers to these and similar questions provide the information and background to let the readers grasp the objectives of the study. Next, the researcher should dwell upon the practical consideration like limitations of funds, time etc. which made the researcher focus on particular parts of the broad area of theoretical and or practical concern. What is the theoretical and or practical importance of the study? How does the research problem he selected relate to past studies and the available store of information or knowledge?

And finally, he should give a specific and precise statement of the research problem as initially formulated. The researcher should also indicate whether he has revised the formulation later on, and if so, what was the nature of the reformulated research problem? What were the revised objectives and hypothesis of the study?

iii. *Research Design and Data Collection*

This section should include all relevant details regarding the design of the study: research methods used, sampling plan, respondents, data collection procedure, data collection instruments, operational definition of variables, pretesting, pilot study, field experiences, additional sources of data, and so on. How was the research design executed? Whether changes made in any of its important aspects? What were those and why were they made? What were the problems encountered in gathering data? Questions of similar nature are answered in this section,

iv. *Data Processing and Analysis*

The researcher in this section describes how were the data processed, edited and analyzed? What Statistical procedures were used? What was the quantum of response? How did he handle the problem of missing data? What were the possible discrepancies in the data collected? How did he construct the scales or indices used in the study? What were the procedures followed for estimating the relevant characteristics?

v. *Findings and Results*

This is perhaps the most interesting and important section of the report. This section contains the organized logical presentation and discussion of the major research findings. The researchers attempt to present and explain the data in this section. This section should include those data that are important

in helping the readers to understand the problem and hypothesis, and findings. All other data should be placed in the appendices. Presented data and referred tables should be shown as close as possible to the relevant descriptive material. All tables' should be in sequences. In brief, the researcher, in this section, should be able to give the answer to the following questions : What did we learn ? How do the findings relate to the research questions presented in the first place? The researcher must not dodge his responsibility to interpret his findings. The implications of the findings should be brought out, keeping in mind the limitations of the study,

vi. Conclusion

This section is considered as the mirror of the report. The reader wants to get everything in one go. This section should therefore, cover the followings :

- a. summary of the discussion in the main sections;
- b. summary of the findings and inferences;
- c. recommendations based on the findings and inferences;
- d. clear statement of action that should be taken as a result of the recommendations, and by whom;
- e. indication to any wider considerations outside the terms of reference of the study, on which the report may have a bearing.

Conclusion and introduction are closely interdependent. If a researcher merely summarizes the conclusions and recommendations in his introduction he still needs to give them in full in the conclusion section.

Recommendations

This section presents a statement of future actions which, in the researcher's opinion, might be worth pursuing. They may concern future research, the development of theory, or the practice of management in relation to the problems studied. Researcher should also include the suggestions both for further research and for the application of the findings to any relevant matter of practical concern.

Summary

The principal function of a summary is to enable a reader to discover the results of the study quickly. A summary is usually a somewhat categorical listing of main findings of the report, often following closely in organization of chapters in the report. It may incorporate a brief outline of the problem and the procedures, but the major emphasis should be on conclusions, implications, and suggestions for further research or action.

Appendices

An appendix usually contains technical materials which would appear cumbersome if included in the body of the report or would unduly interrupt the orderly presentation of the report. A section of appendix should not be regarded as a catch-all. For example, those general purpose tables which are believed to be of value to the readers concerned with the problems of the study but not necessary for the main development of the report may be included in the appendix. Technical details and discussion about sample design, data collection, and measurement procedures may be included separately as appendix. A report should include as an appendix a copy of the questionnaire or the interview schedule or any other instruments that have been used for data collection. If the questionnaire or the data collection instruments are written in local language then it is desirable to have the appendix also include the translation into the language in which the report is written.

Bibliographical References

All published and unpublished documents used in the study should be included as bibliographical reference at the end of the report. Citations should follow a uniform style, with enough details so that a reader can easily locate the original source.

If the report contains numerous references to other publications it may be useful to complete a separate bibliographical Appendix. Each reference should contain full information in the following order:

a. Author (s); b. Title of the reference material; c. edition; d. Place of Publication; e. Publisher; f. Date of Publication; g. Number of pages; h. Price.

Other Formats

Apart from this so-called logical format presented above, there are other formats of writing reports. There is the psychological format where the logical approach is reversed. The conclusions and recommendations are presented at the beginning of the report and the findings are presented later. This format is popularly used for the business clients and professional consultancy reports.

CHAPTER

10

**Computer and
Social Science
Research**

CHAPTER 10

Computer and Social Science Research

A computer is, at its most basic, a machine which can take instructions, and perform computations based on those instructions. Computers range from I In-very small to the very large. Some are capable of doing millions of calculation'. in a single second, while others may take long periods of time to do even (Inmost simple calculations.

This is an age of computers. Today computers are used in a much wider variety of applications ranging from computer games to most sophisticated expert systems. More and more people are now using computers in one way 01 the other and very soon, probably there would be hardly any area of human activity which will remain untouched by computers. It was in the early fifties, when the first computer was available commercially, but it was huge and remained expensive. Although the first microcomputer was introduced in 1971, it was in 1977 when the first fully assembled personal computer (PC') was marketed by *Apple* followed by *Radio Shack* and *Commodore*.

The new generation Personal Computers (PC) has a multitude of applications. Apart from performing the complex and large computation and statistical operations in least possible time, word processing has assumed a major role in computer use, which has greatly enhanced the computer's value as a research tool. In this chapter, an attempt has been made to orient the readers with the basic features of computer and discuss how important role a personal computer (PC) can play in day to day research work of a social science researcher.

What is a Computer?

Computer is an electronic device which, through electric signals, can accept data and instructions in a prescribed form, processes the data into information and furnishes the results (output) in a form which is readable by a person or by another machine. The term is used generally for any kind of computing device, the three main categories being *digital computers*, *analog computers* and *hybrid computers*. By computer, we mostly refer to digital computers which are classified as the *main frame computers*, *minicomputers* and *microcomputers* or *personal computers*. Over the last few years, additional categories of *supercomputers*, *superminies* and *supermicros* have been introduced. This classification is based on the computer's computing power, i.e., a combination of processing capability and speed, size, the amount of memory available and, to a lesser degree, the number and types of input/output devices supported. For instance,

supercomputers are very large with enormous processing speed. They usually contain many Central Processing Units (CPU) and have a processing speed of at least 100 MIPS (Million Instructions Per Second). Although a computer has often been misperceived as something having super-natural qualities, in reality, its basic capabilities are extremely limited. It can hardly perform anything other than basic arithmetic operations (i.e. addition and subtraction of numbers); certain logical operations, such as comparing two numbers A and B (i.e. whether $A > B$, $A = B$ or $A < B$) through following three predetermined paths of computation; storing large volumes of data and information and retrieve them very quickly as and when necessary and through certain built-in error-checking mechanism, carrying on millions of operations every second and run errorless for hours and days at a time. The miracle of a computer is that it can perform the operations, virtually without any error, at an enormous speed.

One of the principal limitations of a computer is that application programs must be available for solving a particular problem. The program may have been written by other people and acquired by the user or developed using a programming language. Even with the increasing availability of software development tools, development of application program may be quite expensive for specific applications.

Computers operate on data. They accept and process data and communicate results. Data fed to the computer are organized into logical groupings to ensure effective processing and useful output. The smallest logical data entry is a file, or data item.

The operations which computers perform on data are classified into four categories: a. input/output; b. calculations; c. logical analysis/comparison; and d. storage and retrieval. In other words, computer consumes input data and through calculations and logical comparison and analysis produces output. It can store data for any period with easy and quick retrieval and backup facilities.

Hardware and Software

To understand computers, two key words are of consummate importance: one is the Hardware and the other is Software. Hardware is the physical equipment/tangible elements (e.g. electro-mechanical component, integrated circuits) in a computer system. Software is the term used to describe the programs that control the operations of the computer system. In fact, the terms software and programs are used interchangeably. Software is intangible if software programs are loaded into the memory of a computer.

Hardware includes the computer itself - the box containing the electronic components and circuitry; the keyboard, which sends messages to

the computer, the monitor, on the face of which the words and symbols appear; the disk or tape drives that store computer data for later retrieval; and the printer which produces the hard copy of the matter that has appeared on the monitor screen and is stored in the memory of the computer. Functionally, a computer system consists of the following four components: Central Processing Unit (CPU), secondary software, input devices and output devices. A CPU itself contains three different units, viz the Control Unit (which controls the computer), the arithmetic and logical unit (or ALU, which performs arithmetic and logical operations) and the primary storage unit or main memory (which is used to store data and programs).

A *microcomputer* is usually equipped with a typewriter like *keyboard* for feeding input and can normally be linked to a CRT (Cathode Ray Tube) monitor for the display of input and output. A key board is devised for encoding characters by depression of keys. This causes the selected code to be generated by each key that is pressed. *Function keys* are the keys on a keyboard which cause a specific operation to take place other than the entry of a standard character from the set of characters available.

A terminal printer is also connected with the computer to provide printed copy of the output on paper. Fully configured system includes floppy disk drives and hard disks which collectively provide extra and permanent storage. In addition, a *mouse* could be attached to almost all PCs. Mouse is a hand operated pointing device connected to the computer. The mouse has up to three buttons that sends signals to the computer. When a mouse button is pressed it does the same action as the button of a keyboard does. Some of the currently available input devices, which are commercially available, are: Keyboard, Disk/Diskette, Mouse, Magnetic Ink Character Reader (MICR), Magnetic Tape, Optical Character Reader (OCR), Optical Mark Reader (OMR), Bar Code Reader, Touch screen, Light-pen, Optical Disk, Digital Disk, Scanner, Camera and Voice. Similarly, the following may be named as some of the commercially available output devices:

- Printer (Line printers, dot-matrix, dot-bank, daisy wheel, laser and inkjet printers)
- Visual Display Unit (VDU) for Monitor (color or monochrome)
- Magnetic Tape
- Disk/Diskette
- Microfilm
- Optical Disk
- Audio (i.e. Vocal output)
- Plotter

The software, on the other hand, consists of the programs that tell the computer what to do, issuing battery of commands that will activate the computer to perform certain specific tasks. One researcher notes "The computer is a dumb tool. When a computer user needs useful work from his computer, software is needed to drive the machine to perform. Personal computers can accomplish a great variety of tasks, but the computer's ability to accomplish a function depends on the software used. Software, then, is the driving force, the necessary ingredient to your computer to do useful things" (Froelich, 1984:3). More specifically the term software is applied to all those programs which in some way can assist all users of a particular type of computer to make the best use of their machines. Software comes in all shapes and sizes. Software may be classified into two broad categories: a. System Software; and b. Application Software.

System Software includes Operating Systems and Programming Language and Utility software. An Operating System is "a set of programs that manages the overall operation of the computer system. The functions of an operating system include keeping track of data stored in memory, managing the flow of information to and from disks, managing information from the keyboard and to the display screen and interpreting and processing the commands entered by the user. *MS-DOS* (Microsoft - Disk Operating System), renamed *PC-DOS* by IBM, is a very popular operating system for IBM PC compatible machines. Because of some added advantages in information network, *UNIX*, developed by Bell Laboratories, is also becoming very popular as a disk operating software.

Programming Languages are the primary tools for creating software. Instructions for the computer must be read into the computer. These instructions (or Programs) must be written in a language which the computer understands. The source program is translated into object code in machine language using compilers or interpreters. The same source program may be run on different computers (provided appropriate compiler/interpreter is available) but the object code may vary from a machine to machine. COBOL, FORTRAN, BASIC, PASCAL, C, Prolog and LISP are some of the commonly used languages.

Application Software may be classified into:

- Special purpose program; and
- General purpose program.

Special purpose programs, as the name indicates, are programs written in solving specific problems, usually in a narrow domain. General purpose programs may be adopted to perform a wide variety of tasks. Both types of software are now-a-days available in packaged form; the user may define a problem and use the software to assist in preparing a solution. Paekap

application software may be purchased off the shelf. Some of the popular application areas are listed below:

Special purpose programs

- Statistical analysis
- Project management
- Accounting and Book-keeping
- Scientific and Engineering
- Geographic Information System (GIS)

General purpose programs

- Word Processing
- Spreadsheet
- Database management
- Graphics Communication

Integrated Packages (e.g. combination of WP, Spreadsheet and Data Base Management System - DBMS).

In connection with the term software, the readers might come across a number of terminologies, some of which are discussed as follows:

Subroutine is the smallest items of software normally provided by a manufacturer. This software is usually routine type and devised to perform a large numbers of routine calculations, edit data for input and output.

Operating systems are programs which are held permanently in the computer memory and are used to control the operations of other programs, particularly in multi-programming system.

Utility Programs are devised to perform some of the basic data handling operations, such as file convention, sorting, controlling location of data in a file.

Debugging software include programs for producing printouts of memory at various stages of a program and also various forms of analysis of the progress of introduction to research a program.

File processing programs are programs devised for performing operations on data files, such as editing, validation, comparing and updating.

In the following paragraphs, a number of computer terminologies are discussed, some are even repetitions, for the convenience of the fresh learners.

The System Unit: The system unit houses the processor and memory of a microcomputer. The Central Processing Unit (CPU) is built from a microprocessor chip (integrated circuits). It carries the actual processing tasks by interpreting and executing the instructions in the program.

Memory: Working in close conjunction with the microprocessor is a form of storage called the computer's memory. It is where the programs along with the data to be input and the results to be output are stored. A computer's memory is actually a collection of chips (transistors, resistor, diodes and capacitors built into a tiny integrated circuit) that are functionally divided into two types: ROM (Read Only Memory) and RAM (Random Access Memory). The microprocessor can read information from ROM, but it can neither erase information from it nor write to it. ROM stores the instructions that start up the computer when the power is turned on, and in some cases, stores some additional programs. The microprocessor can load programs and data into RAM and read and write to RAM. RAM is temporary storage, because the contents are lost when power is switched off.

Byte/Bits: Memories for personal computers are rated according to their capacity, which is measured in thousands of bytes. A byte consists of eight consecutive bits. A bit is equivalent to a single character (e.g. a letter, a number, a punctuation mark, a symbol). A standard abbreviation for thousands of bytes is KB which represents the number 1024 (i.e. multiple of 8), so the capacity of a memory that is expressed as 640 KB means $640 \times 1024 = 655,360$ bytes.

Floppy Disk: This is a flat circular sheet of magnetic material (kept under square shaped protection cover), used to store information. A number of tracks are available on each surface, which is again divided into a number of sectors. It is on the tracks where data are written and read by means of read/write electronic heads. It can store amounts of information depending on its size, quality and the characteristics of the disk drive.

Flash Drive: A flash drive is a small storage device that can be used to transport files from one computer to another. A USB (Universal Serial Bus) flash drive consists of a flash memory data storage device integrated with a USB 1.1 or 2.0 interface. USB flash drives are typically removable and rewritable, and physically much smaller than a floppy disk. Most weigh less than 30 g (1 oz). Its storage capacity as of recent date is as large as 256 GB. USB flash drives are used for the same purposes as floppy disks were. They are smaller, faster, have thousands of times more capacity, and are more durable and reliable because of their lack of moving parts.

Hard disk: It is a high speed, high density form of external memory of a computer. A hard disk holds much more information than the floppy disk,

but because they are fixed into the computer, they cannot be easily transported.

File: As we all understand, a file is an organized collection of records. For computers, it is a collection of instructions, text or data stored on a disk. A text file might be a short letter or a book chapter; a data file could consist of a handful of items or a hundred thousand numbers. For instance, this book was originally written on a computer and stored in a file.

Directory: This is a logical subdivision of a unit of permanent memory (disk). A directory is a special kind of a file to organize other files stored on a disk, much like a cabinet that holds many file folders in an office. A directory system is a convenient way to organize the floppy and hard disk files. The directories allow the users to divide the disk into sections, much the way we put groups of file folders having different subject matters. When a user organizes the hard disk into directories, he does not have to go through hundreds of file names every time looking for a particular file he wants but types DIR on the command line, to show only those files which are saved under a particular directory. **Sub-directories:** These are the further divisions of a directory. A user can create as many as directories and sub-directories as he prefers.

Root directory: This is the original directory. It is also called the parent of all directories and sub-directories. For example, when a user is in the root directory of the hard disk, which is say, identified by the system as the drive "C", he sees the computer screen with a prompt; C". This directory is created by the DOS when the disk is formatted.

Some Popular Software Packages

For both natural and social sciences, advent of computer has made calculations possible which were previously beyond contemplation, because of the time required and drudgery involved in carrying them out. This has greatly and qualitatively accelerated and expanded research in different areas of professional interests. More recently there has been an increasing use of computers for research and data analysis in areas such as social sciences and even in humanities. Following section presents a brief overview of the different types of software that are readily available for this use of the researchers.

Word Processing Software

Word processing is a type of software program that can be installed in a personal computer by means of a series of diskettes that give the computer, directions as to what to do when the operator wishes to process a document. This variety of software usually contains the basic word processing program instructions; a spelling check program, which permits the computer to scan through the text to identify misspelled words and word combinations that

have been written without a space between them; a thesaurus, which permits the operator to call up synonyms for a given word, just as is done in a bound thesaurus; and a printer diskette, which gives instructions to the printer to print out the text with or without headers or footers; to number pages, paragraphs, or lines; to use boldface or regular typeface; to adjust the pitch of the type, the spacing, the justification of the text so that even right and left margins are possible with many other functions.

In word processing, the text as written appears on the computer monitor screen, which gives the writer a chance to correct errors, move, copy or erase words, sentences, or larger blocks of text to different locations within the document or from one document to another, before commanding the computer to print out the formatted text in hard copy. Word processing permits great flexibility in composition. It allows the operator to insert footnotes that will automatically be printed at the foot of the page with the number of the footnote appearing in the text at the proper place.

In brief, through word processor the researchers are able to create documents, edit them, emphasize certain ideas within them with bold face or italics, move sections of text or transpose paragraphs, create footnotes and running heads, automatically number pages, check spelling, call upon a thesaurus to supply a synonym, or adjust one's writing style.

Popular word processing packages include WordPerfect, MS-Word, and MacWrite. These word processing packages allow users to do the following interesting features:

Word Wrap/Enter Key: One outstanding word processing feature is a word wrap. A word processor decides for Users and automatically moves the cursor to the next line. As users keep typing, the words "wrap around" to the next line. To begin a new paragraph or leave a blank line, users press the Enter key.

Search/Replace: A search command allows users to find any word in a document that users know exists in user's document. When users search, the cursor will move to the first place where the item appears. The find command automatically replaces the word users search for with a new word. The search and replace commands are useful for finding and fixing errors.

Block/Move: The portion of text users wish to move is a block. Users mark the block by giving commands that produce highlighting, a band of light over the area. The task of moving the block is called a block move. The block command may also be used to delete text or to copy chunks of text into another document.

Margins: Margins may be justified to right, left or full (right and left at the same time) in the most word processing packages. That is, they may be evened up to the right, left or both side simultaneously.

Centering/Emphasizing: Headings of a document may be centered. Words or phrases may be typed underlined or boldface (extra dark lettering) for emphasis.

Spelling Checker: A spelling- checker program can check spelling errors in a document automatically.

Thesaurus: This programs enable users to quickly find the right word or an alternative word by presenting users with an on-screen thesaurus.

Mail Merge: This feature allows users to merge different names and addresses so that users can mail out the same form letter to different people.

Desktop Publishing: Today's advanced word processing programs can perform desktop publishing capabilities. This feature enables users to mix text and graphics to produce newsletters and other publications of nearly professional quality.

Outliner: Sometimes called *idea processors*. It helps users organize and outline users' thoughts before users prepare a document or develop a presentation.

Grammar/Style Checker: These programs can be used to identify and correct grammar and punctuation errors.

Importing: Most of the programs have an *importing* feature. Files may be retrieved from non-text programs such as spreadsheets and graphics and added to the word processing program.

Statistics Software

All statistics packages perform two types of statistical analyses: descriptive and inferential. In addition, all statistical packages assume a working knowledge of basic descriptive statistics, the rules of statistical inference and major types of statistical procedures.

All major statistical packages found on mainframe are now available for the personal computers. These are Statistical Packages for Social Sciences (SPSS), Statistical Analysis system (SAS), Microstat, etc. Several other statistical packages also can be purchased for the use of desktop computers.

A typical statistical package will offer at least the following statistical functions:

- a. Data Management
- b. Descriptive Statistics
- c. Frequency distribution
- d. Hypothesis Testing

- | | |
|------------------------------|----------------------------------|
| e. Analysis of Variance | f. Scatter Plot |
| g. Correlation Matrix | h. Regression Analysis |
| i. Time Series Analysis | j. Cross tab and Chi-Square test |
| k. Probability distribution. | |

Almost all statistical packages can produce univariate statistics including mean, standard deviation, standard, error, variance, skewness, kurtosis, percentiles, minimum and maximum number, Distribution of values in graphs like histogram, bar chart etc.

They can also produce bivariate statistics like correlation, regression coefficients etc. The bivariate distribution of values are also displayed in scatter diagram. Outputs, including frequencies, row and column percentages, expected values, chi-square statistics and Fisher's exact test can be produced. Multiple n-way cross tabulation tables can be created. In addition paired 't' test, Wilcoxon paired sample test, Durbin- Watson test, Mann-Whitnet U test can be done direct entry of cell frequencies. Some statistical packages has a built-in facilities for graphical presentation of data. Typical graphical presentation includes bar chart, line graph, stacked bar graphs, three dimensional bar, scatter plots. Graphic output can be edited to add or change legends, draw lines, circles, rectangles, polygons and display can be moved on the screen and or be saved to a disk.

Spreadsheets

It is a popular application package for personal computers which allows the user to analyze information presented in tabular form, manipulating rows and columns and allowing vertical and horizontal scrolling when the physical capacity of the visual display unit cannot accommodate all the available data. In other words, a spreadsheet is an electronic worksheet with rows and columns. The typical electronic spreadsheet is large with 256 columns across and 8192 rows down. Obviously, such a mammoth array cannot be displayed on a monitor. So a part of the sheet, called window, is usually displayed at one time. A standard window usually displays 12 columns and 20 rows.

A spreadsheet is a versatile tool, by virtue of which, any number displayed mi the sheet can be added, subtracted, multiplied, or divided. Any value could be raised to any power, averages can be obtained, percentages can be computed, or a range of graphical presentation of the data can be made. Spreadsheet software enables an user to organize numbers and formulas into a rectangular array of cells. Previously, manual computation methods involved the time-consuming task of recalculating the values whenever a single item in a row 01 column was changed, e.g. in budget or sales forecast. However, using spreadsheet software the recalculation can be

done automatically. This means that the user can now try out different values of parameters and study their influence on the results. By enabling the user to study these "what if scenarios, this provides an excellent tool for financial modeling and decision support systems. Different types of accounting and financial analysis can be done by Spreadsheets. Spreadsheets can also produce different mathematical relationships and calculations. Depending on the nature of programming, it can compute different financial analyses like net present value (NPV), internal rate of return (IRR), calculations concerning loans, annuities, depreciation, cash flow forecasting, investment analysis, budgeting, planning and similar other functions. This software allows program, financial, budget, accounting and audit analysts to do a number of things in a short period of time. Spreadsheet program designed for PCs or microcomputers can quickly analyze and display results of corresponding changes in a matrix. A budget analyst, for example, can ask "what if Tk.2 million is taken away from one program and put somewhere else", and see the effects instantly.

Most popular and widely used spreadsheet program is Excel. It is a powerful, easy to use, and efficient spreadsheet program. Excel is highly interactive. Its spreadsheet cells are arranged in a collection of rows and columns, each of which can hold a number, a text string, or a formula that performs a function, such as calculation. It is easy to copy and move cells as well as modify formulas. The spreadsheet is displayed on the computer screen in a scrollable window that allows the document to be as deep or as wide as required.

Database Management

Before introducing data base management system (DBMS), let us briefly review what do we mean by data? Data in general expression used to describe any group of *operands* or *factors* consisting of numbers, alphabetic characters or symbols which denote any condition, value of state. The word data is used as collective noun and is usually accompanied by a single verb. Data is sometimes contrasted with *information* which is said to be the result of processing of data, so that information derives from the assembly, analysis of summarizing of data into meaningful form.

Data base management program is a tool for organizing information. It is particularly helpful in organizing information from several files and getting it all together into one massive electronic filing system. Database is a technique of storing data in a manner such that most of these problems are overcome. In order to do this, a software known generously as DBMS (Database Management System) is needed. It manages the storing and retrieving of all data which is now kept not in files but in a "database". There are several methods of arranging and storing the data, for example,

relational, network and hierarchical. The DBMS is responsible for storing the data in the secondary storage and retrieving the required data for the application programs. In short, the DBMS is the "software for:

- integrating the data so that it can be readily available for any anticipated need;
- avoiding duplications on the database;
- protecting the system from unauthorized use;
- updating the database.

Computer users have increasingly accepted the concept that the various subsystems of an organization should be integrated to form a total system. Thus all users of data within the organization share common records of information and the information available to staff and management at every level is drawn from the same source, providing mutually consistent levels of accuracy to all users. Data bases whether they are stored on paper, card, tape or in a computer are just collections of facts organized in some way so that they can be retrieved and used quickly and systematically as the time demands. With computer huge information can be assembled and interrelated by means of data base management programs. There are two basic usage for a database; a. to perform routine tasks as set by the users like combined presentation of data with an *if and then* condition; b. to obtain specific information whenever necessary from the data base.

Data base programs come in two basic forms- simple and complex. Simple database program produce what are called "flat" files, which means simply all the data elements for a case are stored in a single file. Complex database may differ from the simple ones in significant ways. Instead of producing a single file of data for each case, a user can construct several different files, each of which may contain some information about a particular case. The files are related by the common data elements in each, and hence are called relational data bases.

DBMS vary enormously in how easy they are to use. Some are intended to be used in command modes i.e., one has to know when and how to type on the command line, one of a restricted sort of commands that the system understands; this can be a bit unnerving until the user is familiarized with the commands, and how they work. Menu driven software, on the other hand, offers a main menu listing the options from which the user can choose. This is usually easier for a beginner, but going through successive menus can be tedious if there is a large number of possibilities.

Oracle is one of the most popularly used database. It is a relational database management system software. It is considered one of the most non-trivial systems. Oracle supports SQL that runs on minis and main frames and even on personal systems. It is technically very sound and being used in more than 1000 multinational corporations and countless websites. Oracle database is easy to install and quite simple to manage. It is used in almost all huge application and one popular among them in which oracle takes its major presence is banking. It offers a powerful combination of technology and comprehensive, pre-integrated business applications, including key functionality.

Statistical Package for Social Sciences (SPSS)

SPSS (originally, Statistical Package for the Social Sciences) is a computer application that provides statistical analysis of data. SPSS was released in its first version in 1968 after being developed by Norman H. Nie and C. Hadlai Hull. SPSS is among the most widely used programs for statistical analysis in social science. It allows for in-depth data access and preparation, analytical reporting, graphics and modeling. It is used by social scientists, market researchers, health researchers, survey companies, government officials, education researchers and others. In addition to statistical analysis, SPSS also deals with data management like case selection, file reshaping, creating derived data and data documentation. For statistical purpose SPSS covers the following: a. *Descriptive statistics*: Cross tabulation, Frequencies, Descriptive, Explore, Descriptive Ratio Statistics, b. *Bivariate statistics*: Means, t-test, ANOVA, Correlation (bivariate, partial, distances), Nonparametric tests, c. Prediction for numerical outcomes - Linear regression, d. *Prediction for identifying groups*: Factor analysis, cluster analysis (two-step, K-means, hierarchical).

Selected Software for Qualitative Data Analysis

It is generally assumed that computer is meant to handle only quantitative data. However, these various software have been developed to help the researchers to process and analyze qualitative data that are generated from interview, observations, filed notes etc. Matrix below presents an overview of some of the selected softwares that are of late used by the researchers.

Figure 10.1: Purposes of Various Types of Software

Software	Purpose of the Software
<i>QDA Miner</i>	<i>QDA Miner is an easy-to-use mixed-model qualitative data analysis software package for coding, annotating, retrieving and analyzing small and large collections of documents and images. It is used to analyze interview or focus-group transcripts, legal documents, journal articles, even entire books, as well as drawing, photographs, paintings, and other types of visual documents. Source:(http://www.provalisresearch.com/QDAMiner/ODAMinerDesc.html)</i>
<i>ATLAS.ti</i>	<i>This software is used for text interpretation, text management and the extraction of conceptual knowledge from documents. It supports the qualitative analysis of large bodies of textual, graphical, audio and video data. Source:http://www.content-analysis.de/software/qualitative-analysis</i>
<i>The Ethnograph</i>	<i>Software for qualitative research and data analysis. It facilitates the management and analysis of text based data such as transcripts of interviews, focus groups, field notes, diaries, meeting minutes, and other documents. Source:http://www. content-analysis.de/software/qualitative-analysis</i>
<i>Kwalitan</i>	<i>Kwalitan is a support program for the analysis of qualitative data drawn from interviews and observations, existing written material, such as articles from newspapers, annual reports of enterprises, ancient manuscripts, and so on. The program has been developed in accordance with the procedures of grounded theory approach., in which the researcher tries to generate a theoretical framework by means of an interpretative analysis of the qualitative material. Source:http://www. content-analysis, de/software/qualitative-analysis</i>
<i>CDC EZ-Text</i>	<i>"CDC EZ-Text" is a software program developed to assist researchers to design a series of data entry templates tailored to their questionnaire and interview schedule as well as case studies. Data from respondents can be typed directly into the templates or copied from word processor documents. Following data entry, investigators can interactively create on-line codebooks, apply codes to specific response passages, develop case studies, conduct database searches to identify text passages that meet user-specified conditions, and export data in a wide array of formats for further analysis with other qualitative or statistical analysis software programs. Project managers can merge data files generated by different interviewers for combined cross-site analyses. The ability to export and import the codebook helps to coordinate the efforts of multiple coders simultaneously working with copies of the same database file. Source:http://www.cdc.gov/hiv/topics/surveillance/resoi4rces/software/ez-text/index.htm</i>

Internet Search

Internet has now become an ocean of research information and relevant data almost in any topic or subject matter. Country specific, regional, sub regional and global scale data and information now can easily be collected and downloaded. What the researcher needs to do is to set some "key words" related to desired topics. The key words could topic or theme specific institution or organization specific and or even country specific. Once the key word is placed and entered in the search line of the search engine, within seconds the researcher will get the reference of numerous websites and specific documents directly and even indirectly related to the research theme. For example if we write "governance and development" in the search line the Google will present as many as 51,000,000 results just in 0.24 seconds (as of October 6th, 2010).

There are number of 'search engines' like Google, Yahoo, AltaVista, AskJeeves, AlltheWeb, Lycos and so on. During recent years, "Google" (www.google.com) is rated by many as the most user friendly and efficient search engine.

Suppose you would like to draw some data from UNDP but you don't know the address of UNDP. In such case you have to put the word UNDP and click the search button. This search result page will lead you to the website of UNDP. If you want to go to the website of local office of UNDP at Bangladesh then you have to add Bangladesh as keyword with UNDP.

If you want to search for any write-up, article or research documents on any specific issue - say "Public Policy" then you have to put "Public Policy" as keyword. The search result page will carry you to the different write-up/articles on this topic. The documents of these search results can be divided into two groups:

1. *Open Source/Free*: the documents which can be downloaded without any charges.
2. *Password Based Source/Restricted Source*: For downloading any documents from these sites, one must have password or have to pay for entering into these websites. Some of world renowned journal database are: Blackwell-Synergy, Sage, Taylor & Francis Journals, SpringerLink etc. For entering into these journal database one needs to have a password for which one has to subscribe its membership.

Internet Search Techniques

There are two ways one can browse the Internet. One is by writing out a known web address on the 'Internet Address Bar' and the other is through 'search engines', when one does not know a specific web address.

Address liar

An address for Internet search is constructed by using the domain name and extensions. Such extensions may be very long with main slashes. The domain name (DN) is the unique on-line address name that has been registered with the Internet Network Information Center (InterNIC) upon payment of joining fee and subsequent annual payment for a certain size of site (50MB is now the minimum). For example, UNDP has registered its DN as <www.undp.org>, the end part of which signifies the registered domain classification (though they are not always accurately meaningful),

ac = academic (usually used in UK and British areas)

co or com = company or commercial organization

edu = educational (usually used in USA)

gov = government body mil

mil = military site

net = Internet gateway or administrative host

org = non-profit organization

If a Domain Name holder wishes it can upload its homepage to the same address. As the webpage grows, the main address will be extended with further additions, as long as its size is not exhausted. The address may be extended step by step, e.g.

<www.undp.org/gender> <www.undp.org/gender/resources

<www.undp.org/gender/resources/gm [to gender mainstreaming page/ document]

<www.undp.org/gender/resources/gm_info_module

<www.undp.org/gender/resources/gm_info_module.html>

[html means HyperText Mark-up Language. It may be pdf, jpg or even doc]

If you know a web address that begins with http://www., you may eliminate the http:// and start with <www. on the Internet search menu bar, but if the web address contains no www at the beginning, then you must start with <http://

If the Internet fails to deliver

Sometimes a long address like the above example <www.undp.org/gender/resources/gm_info_module.html> may fail to deliver the requested webpage. This problem can be overcome by writing on tin-address space only the Domain address, which is www.undp.org

Once this main page (called the homepage) appears, one can search from the contents/links therein to navigate to a particular section or subpage.

Search Engines

The Internet is a 'network of networks of computers'. *Search engines* take your query to almost all such networks and come up with listed results. You can then choose from the list which one you want and click on the entry. A *simple search* request, writing a name or a subject name in the search box of a search engine, may yield many millions of entries. This is very unhelpful. Therefore, you may need to perform what is known as an *Advanced Internet Search*, using a Boolean search determinant. This strategy combines two or more search terms or phrases to produce more relevant entries cutting out the ones with no combination result. This is done by using '+', '-', '<' '>' and '-*' signs between words or phrases. For example, if you search for Gender Mainstreaming, you get over 699,000 entries. But if you chose to phrase it (meaning use double apostrophes " ") you get slightly fewer, 639,000. Then you can narrow the search by using the Boolean sign '+' with another phrase "Bangladesh". This time you get only 15,500 entries. The double apostrophes application is called *phrase searching*.

However, you must be able to understand the entries that a search engine produces: many of them are just repetitions. Make a notebook (either electronic or manual) recording all your important web addresses that will save time and inconvenience in the future.

General References

Aaron, H.J. (1978), *Politics and Professors*, Washington B.C.: The Brooking Institute.

Abrams, Mark (1951), *Surveys and Social Action*, London: Heinemann.

Ackoff, Russell, and Pritzer, L. (1951), *The Methodology of Survey Research. International Journal of Opinion Attitude Research* 5:313T334.

Armour, Sidney J. (1966), *Introduction to Statistical Analysis and Inference for Psychology and Education*, New York: John Wiley.

Arthus, Maurice (1943), *Philosophy of Scientific Investigation*, Baltimore: John Hopkins University Press.

Ausubel, Herman (1959), *Historians and their Crafts: The Presidential Address of the American Historical Association, 1884-1945*, New York: Columbia University Press.

Babbie, Earl (1973), *Survey Research Methods*, Belmont: Wadsworth.

Babbie, Earl (1973), *The Practice of Social Research*, Belmont: Wadsworth.

Backstrom, C.H. and Hursh, G.D. (1963), *Survey Research*, Evanston: North Western University Press.

Bar/un, Jacques and Graff, Henry (1957), *The Modern Researcher*, New York: Brace and Company.

Bennett, Roger (1983), *Management Research*, Geneva: International Labour Organization.

Berelson, B (1952), *Content Analysis in Communication Research*, New York: Free Press.

Beveridge, W.I. (1950), *Scientific Investigation*, New York : Vintage Books.

Bickman, Leonard; Debra J. Rog edited (1998), *Handbook of Applied Social Research Methods*, New Delhi Sage Publications.

Blalock, A.B., and Blalock, Jr, H.M. (1982), *Introduction to Social Research*, London: Prentice Hall.

Blalock, Jr, H.M. and Blalock A.B. (1964), *Causal Influences in Non-experimental Research*, New York: W. W. Norton.

Blalock, Jr, H.M. and Blalock. A.B. (1968), *Methodology in Social Research*, New York: McGraw-Hill.

Bogden, R., and Taylor, S.J. (1975), *Introduction to Qualitative Methods*, New York: Wiley.

Borgatta, E.F.(1969), *Sociological Methodology*, San Francisco: JosseyBass Inc.

Bradbun, N., Sudman, S. (1979), *Improving Interview Method and Questionnaire Design*, Chicago: Jossey Bass.

Bryman, Alan (2004), *Social Research Methods*, Oxford University Press.

Bryman, Alan (1989), *Research Methods and Organization Study*, Boston: Unwin Hyman.

Byers, Robert (1986), *Everyman's Database Primer*, Delhi : B.P.H Publications.

Campbell, D.T, Stanley, J.C. (1966), *Experimental and Quasi-Experimental Designs for Research*, Chicago: Rand McNally.

Campbell, D.T., (1969) "Reforms as experiments" *American Psychologist*, Vol 24, pp.409-429.

Chandor, Anthony (1985), *Dictionary of Computers*, London: The Penguin.

Chaplin, Francis Stewart (1955), *Experimental Designs in Sociological Research*, New York: Harper.

Charles A. Lave and Harch, J.G. (1975), *An Introduction to Model in Social Science*, New York: Harper and Row, 1975.

Cochran, W. and Cox G. (1957), *Experimental Design*, New York: Wilsey.
Cochran, W.G. (1963), *Sampling Techniques*, New York: Wiley.

Cohen, M.R. and Nagel E (1978), *An Introduction to Logic and Scientific Method*, Kent: Whitstable Litho Limited.

Cozby, Paul C. (1977), *Methods in Behavioral Research*, London: Mayfield Publishing Company.

Cristina P.Parel (et, al) (1973), *Sampling Design and Procedures*, New York : ADC.

Deming, W.E. (1950), *Some Theory of Sampling*, New York: Wiley.

Deutsch, Karl (1951), "Mechanism, Organism and Society :Some Models of Natural and Social Sciences, *Philosophy of Science*, Vol XVIII, pp.230-34.

Deutsch, Karl W. (1951), "Mechanism, Organism and Society: Some Models of natural and Social Sciences." *Philosophy of Science*, Vol. XVIII, pp.230- 231.

Doby, John 'l'.(ccl) (1954), *An Introduction to Social Research*, Harrisburgc, Pcn: The Slackpolc Co.

- Doby, John Thomas (1967), *An Introduction to Social Research*. New York : Appleton-Century Crofts.
- Doty, P. (1982), The Role of Evaluation Research Broker, in Saxe & D.Kroetz (eds), *New Directions of Programme Evaluation* (No. 14), San Francisco : Jossey-Bass.
- Dulin, R.(1969), *Theory Building*, Free Press, New York.
- Durkheim, E, (1938), *The Rules of Sociological Methods*: Glencoe.
- Durverger, Maurice (1961), *An Introduction to the Social Sciences: With Special their Methods*. New York: Frederic Praeger. •
- Easrtman, Byron D. (1984), *Interpreting Mathematical Economics and Econometrics*, London: Macmillan Education Ltd.
- Ericson, B.H. and Nosanchuk, T.A. (1977), *Understanding Data*, Toronto: McGraw-Hill.
- Franklin, Billy and Osborne, Harold (ed) (1971), *Research Methods: Issues and Insights*, California: Wadsworth Publishing Company.
- Franklin, Donald and Stanley, J. (eds) (197 1), *Research Methods: Issues and Insights*, Belmont: Wadsworth.
- Froelich, Robert (1984), *The Free Software Catalog and Directory*, New York: Crown Publishers,
- Gaining, J. (1967), *Theory and Methods of Social Research*, London: Allen and Unwin.
- Gerbner, G. (et,al) (1969), *The Analysis of Communication Content Developments in Scientific Theories and Computer Techniques*, New York : Wiley
- Ghosh, B.N. (1982), *Scientific Method and Social Research*, New Delhi: Sterling Publishers Pvt. Ltd
- Girshik, L.B., Williamson, J.B. (1982) "The Politics of Measuring Poverty Among the Elderly" *Policy Studies Journal*, Vol.10, No.3, pp.483-498.
- Glock, C.Y. (1967), Survey Design and Analysis in Sociology, In C.Y. Glock (ed) *Survey Research in the Social Sciences*. New York: Russell Sage Foundation.
- Glock, C.Y. (1967), *Survey Research in the Social Sciences*, New York: Russell Sage Foundation.
- Good, Carter V. (1959), *Introduction to Education Research*, NY Appleton-Century-Croffis, Inc.
- Good, W.G. and P.K. Halt, (1952), *Methods in Social Research*, New York Mc-Graw Hill.

Gopal, M.H. (1963), *An Introduction to Research Procedures in Social Sciences*, New Delhi : Asia Publishing House.

Government of Bangladesh, *Fourth Five Year Plan (FFYP)* (1991), Planning Commission, 1991.

Gupta, S.P. (1980), *Statistical Method*, New Delhi: Sultan Chand & Sons.

Holsti, O.K. (1962) "The Belief System and National Image" Ph.!) Dissertation, University Stanford University.

Holsti, O.K. (1969), *Content Analysis for the Social Sciences and Humanities*. Reading, Mass : Addison-Wesley.

Husain, Saadat (nd) The Relevance and Problems of Empirical Studies in Bangladesh, Proceedings of the One day Seminar on the Use of Statistics in Local Level Planning and Rural Development, Dhaka.

Husain, T (1970), "Use of Anthropologist in Project Appraisal by World Bank" Paper presented at the IX International Congress of Anthropological and Ethnological Sciences in Oshkosh, Wisconsin, August, 1973.

Hyman, Herbert H. (1954), *Interviewing in Social Research*, Chicago: University of Chicago Press.

Hyman, Herbert H. (1955), *Survey Design and Analysis: Principles, Cases and Procedures*, New York: The Free Press.

Janis, I.L. (1965), "The Problem of validating Content Analysis," in H. D. Lasswell et. al; (eds) *Language of Politics*, Cambridge : MIT Press.

Kearl, Bryant (ed) (1976), *Field Data Collection in Social Sciences: Experiences in Africa and the Middle East*, New York: ADC.

Kerlinger, Fred N. (1964), *Foundations of Behavioral Research: Educational and Psychological Inquiry*, New York: Holt, Rinehart and Winston.

Kidder, L.H. (1981), Qualitative Research and Quasi-Experimental Framework In M. B. Brewer and B.E.Collins (eds) *Knowing and Validating*, San Francisco : Jossey Bass.

Kish, Leslie (1955), *Survey Sampling*, New York: John Wiley.

Labovitz, Sanford and Robert Hagedorn, (1976) *Introduction to Social Research*, New York : McGraw-Hill Book Company.

Lave, C.A., and Harch, J.C. (1975), *An Introduction to Model in Social Science*, New York: Harper and Row.

Leedy, Paul D, (1980) *Practical Research Planning and Design*, London: Macmillan.

Leedy, Paul D.(1989), *Practical Research* (4th ed), New York: Macmillan.

- Lynn, L.E. Jr (1977), Policy Relevant Social Research : What Does it Look Like ? In M. Guttentag and S.Saar (eds), *Evaluation Studies Review, Vol.2*, Baverley Hills, Calif: Sage Publications.
- Maccoby, E.E and Maccoby, N. (1954), The Interview : A Tool of Social Science In G.Lindzey (ed), *Handbook of Social Psychology*, Reading, Mass: Addison-Wesley.
- Majchrzak, A. (1984), *Method For Policy Research*, London : SAGE Publications.,
- McCall, George and Simmons J.L (ed)(1969), *Issues in Participant Observation : A Text and Reader*, Reading : Addison-Wesley.
- Merton, R.K. (1968), *Social Theory and Social Structure*, New York: Free Press.
- Merton, R.K., and Daniel Lerner (1951), Social Scientist and Research Policy
In Harold Laswell and Daniel Lerner, (eds) *The Policy Sciences*, Stanford, California: Stanford University Press.
- Merton, R.K., Fiske, M., Kendall, P.L. (1965), *The Focused Interview*, Glencoe, Illinois : Free Press.
- Miller, D.C. (1964), *Handbook of Research Design in Social Measurement*. New York: David McKay.
- Miller, Gerald J and Marcia L. Whicker edited (2009), *Handbook of Research in Public Administration*, NY: Marcel Dekker Inc.
- Monroe, Judson (1980), *Effective Research and Report Writing in Government*, New York: McGraw Hill Book Company.
- Moser, C.A. (1958), *Survey Methods in Social Investigation*, London: W. Heinemann.
- Moser, C.A., and Calton, G. (1972), *Survey Methods in Social Investigation*, New York: Basic Books.
- Northrop, F.S.C. (1947), *The Logic of Science and Humanities*, London:MacMillan.
- Nueman, Lawrence w, (2007), *Basics of Social Research - Qualitative and Quantitative Approaches*, Boston: Pearson, USA.
- Oppenheim, A.N. (1966), *Questionnaire Design and Attitude Measurement*, New York: Basic Books.
- Parel, Cristina P. (ed,al) (1978), *Social Survey and Research Design*, Quc/oti City : Philippines Social Science Council.

Parsons, T. (1968), *The Structure of Social Action*, New York : Free Press.

Parten, Mildred. (1965), *Surveys, Pools and Samples*, New York Harper International.

Payne, Stanley (1951), *The Art of Asking Questions*, Princeton: Princeton University Press.

Phillips, D. (1971), *Knowledge from What ? Theories and Methods in Social Research*, Chicago: Rand McNally.

Pillai, K. C. and Sreedharan A. (1957), *Concise Tables for Statistician*, Manila: The Statistical Center, University of the Philippines.

Quade, E.S. (1975), *Analysis for Public Decisions*, New York : American Elsevier Publishing Company, Inc.

Ralph W Tyler (1960) "The Contributions of the Behavioral Science to Educational Research", in Frank W. Banghart (ed.) *First Annual Phi Delta Kappa Symposium of Educational Research*, Bloomington, Ind: Phi Delta Kappa.

Rose, Ranold Marshall (1954), *Theory and Methods in the Social Sciences*, Minneapolis : University of Minnesota Press.

Rosenberg, M. (1968), *The Logic of Survey Analysis*, New York : Basic Books. Rosenthal, R. (1984), *Meta-Analysis*, Beverly Hills, CA: Sage.

Sackett, G. (1978), *Observing Behavior: Data Collection and Analysis Methods*, Baltimore: University Park Press.

Sanders, Donald (1986), *Computers today*, New York : McGraw Hill Book Company.

Scales, D.E., and Yeoman, A. (1950), *The Effects of Questionnaire Form on Course Request of Employed Adults*, Washington : American Council of Education.

Schwartz, Morrison S. and Schwartz, Charlotte G. (1955), "Problems of Participants Observation" *American Journal of Sociology*, Vol.60. pp.343~53.

Selltiz, C, Johada, M. Dentsch and Cook, S.(1965), *Research Methods in Social Relations*. New York: Renold .

Shah, Vimal, (1977), *Reporting Research*, New York: A/D/C.

Simon, Julian (1969), *Basic Research Methods in Social Science : The Art of Empirical Investigation*, New York: Random House.

Sjoberg, G., and R. Nett (1968), *A Methodology for Social Research*, New York": **Harper ami Row.**

- Stouffer, Samuel (1962), *Social Research to Test Ideas*, New York : Free Press of Glencoe.
- Strauss, A.L. and E.G. Glaser (1967), *The discovery of Grounded Theory*, Chicago : Aldine. *The Encyclopedia of Social Sciences*, Vol IX, McMillan.
- Theobald, D.W. (1968), *An Introduction to 'the Philosophy of Science*, London: Methuen.
- Thirkettle, G.L. (1974), *Wheldon's Business Statistics and Statistical Methods*, London: The English Language Book Society.
- Tukey, J.W. (1977), *Exploratory Data Analysis*, Reading' Mass: Addition-Wesley.
- Tyler, Ralph (1960), The Contribution of the Behavioral Science to Educational Research, In Frank W. Banghart (ed), *First Annual Phi Kappa Symposium of Educational Research*, Bloomington : Phi Delta Kappa. Warwick, D.P., and Lininger, C.A. (1975), *The Sample Survey: Theory and Practice*. New York: McGraw Hill.
- Wilkinson, T.S and P.L. Bhandarkar (1982), *Methodology and Techniques of Research*, Bombay: Himalaya Publishing House.
- Williamson, 1, and Karp, D. (1977), *The Research Craft : An Introduction to Social Science Methods*. Boston: Little-Brown.
- Young, P.V. (1966), *Scientific Social Survey and Research: An Introduction to the Background, Content, Methods, Principles and Analysis of Social Studies*, Englewood, Cliffs, N.J.: Prentice- Hall.
- Young, P.V. (1975), *Scientific Social Surveys and Research*, New Delhi: Prentice Hall of India.

ANNEX I

Sample Questionnaire

MANPOWER DIVISION
Office of the President
Republic of Seychelles

SURVEY ON MANAGEMENT PRACTICE AND CULTURE IN SEYCHELLES*

[The purpose of this research is to develop a general understanding about the management practices /processes and constraints in Seychelles. We are therefore requesting that you give us some basic information and your views as well as opinions by filling in the questionnaire. The questionnaire is anonymous and you are not asked to sign it, though you may do so if you wish.]

SECTION-I

1. Your age:_____years.
2. Your Entry Point:_____
3. Your length of service with Seychelles Government _____ year.
4. Academic Qualifications.

Levels	Name of the Institution	Year of Graduation
Junior School		
High School ('O' Level)		
Pre-University ('A' Level)		
Diploma		
Bachelors		
Masters / Post Graduate		
PhD or Equivalent		

* *This questionnaire was designed and administered by the author while he was working as a Management Consultant to the President's Secretariat, Republic of Seychelles.*

5. Training

Training	Name of the Institute	Where	When	Duration
Management				
Professional				

SECTION-II

6. We have identified some broad categories of managerial functions/ roles. Could you please rate your direct involvement in these functional areas as an executive? Please RATE your involvement according to the following scale.

1 = Very regular 2 = Often 3 = Sometimes 4 = Rarely 5 = Not at all

--

Managerial Functions

Planning	Your Rate
Goal / Objective Setting	
Strategy Formulation	
Policy Formulation	
Program Design	
Action Plan Design	

Decision Making	Your Rate
Routine Decision	
Non-Programmed Decision	
Strategic Decision	

Organization	Your Rate
Designing Structure	
Determining Role & Functions	
Reorganizing Methods/Processes	
Clarifying Authority & Responsibility	
Coordinating Tasks	

Staffing	Your Rate
Manpower Planning	
Selection Process	
Staff Appraisal	
In-House Training Design	
Grievance Handling	

Budgeting	Your Rate
Ground works & preparation	
Analysis & Appraisal	
Negotiation	
Control	

Leadership	Your Rate
Staff Designing	
Reward System	
Team Building	

Communication	Your Rate
Meeting	
External Negotiation	
Internal Negotiation	
Handling Grapevine	

Controlling	Your Rate
Controlling subordinates	
Evaluation & Monitoring Projects/Programme	
Establishing Standards	
Designing Corrective Measures	

Crisis Handling	Your Rate
Crisis due to Human Factors	
Crisis due to Financial Factors	
Crisis due to uncertain factors	
Crisis due to mechanical maintenance factors	

Pro-Active Functions (rate only when it is applicable)	Your Rate
Research & Development	
Project Preparation	
Policy Lobbying	
Process/Structure/ Method Development	

7. Please make an approximate distribution of the executive time that you usually spend for the following managerial functions.

Crisis Handling	% of time spent
Planning	
Organizing	
Decision Making	
Staffing	
Controlling	
Communication	
Crisis Handling	
Budgeting Pro-Active	100%

8. Management specialists suggest that environmental factors have significant impact on management processes and practices. Could you please tell us in what extent these factors influence/ affect your management processes/ practices?

Environmental factors	Extent of Influence			
	Very much	Much	Not Much	Not at all
Socio-Cultural				
Political				
Economic				
Educational				
Other (specify)				

9. Following are some general statements. Please tick in the appropriate box based on your judgment.

General statements	Strongly Agree			Strongly Disagree	
	1	2	3	4	5
Critics argue that management principles are limited and do not always reflect the organizational and managerial reality.					
Management is an Art not a Science.					
Men are generally selfish.					
It is general human tendency to avoid difficult and hard works.					
Views expressed by 'authority' should be accepted unquestioned.					
If there is a good internal management team-inter-organizational cooperation is not a must for organizational goal accomplishment.					
Achievement in work is the function of one's education.					
Achievement in work is the function of one's experience.					
Achievement in work is the function of one's confidence.					
One's social status & prestige are the functions of his wealth and material base.					
One's social status & prestige are the functions of his education and expertise.					
One's social status & prestige are the functions of his power base.					
Risk taking is a part of manager's role.					
The more you change your structure/system methods -the more you gain/achieve.					
There is one best way for carrying out every management function.					

SECTION-III

10. Please tick (/) a statement which you think is most appropriate.

- () Planning should be done by a core of specialists/ professionals.
- () Only managers with experience should be assigned to planning responsibilities.
- () Planning should be done by the Chief Executive with an active support of the professionals.
- () Planning should be done by each departmental / section heads.
- () Planning should be done by a participative group exercise.

11. To what extent to you think your role as a manager is controlled by your boss/or people with higher authority.

Highly Controlled					No Control
1	2	3	4	5	

12. How would you identify the structural arrangement of your organization?

Highly Centralized					Highly Decentralized
1	2	3	4	5	

13. How would you assess the degree of the work specialization at your organization?

Highly Specialized					Not Specialized
1	2	3	4	5	

14. How often do you form 'committee' to carry out management assignment?

Very Often					Rarely
1	2	3	4	5	

15. How would you generally classify the management approach in Seychelles?

Authoritarian					Participative
1	2	3	4	5	

16. What is your overall rating of the level of staff morale and motivation in your organization?

	High			Low	
	1	2	3	4	5
Motivation					
Morale					

17. How do you rate the nature and condition of 'employee welfare' at your organization?

Very Satisfactory			Not Satisfactory	
1	2	3	4	5

18. What techniques do you follow to motivate your staff? (Please list a few)

- a)
- b)
- c)
- d)

SECTION-IV

19. How difficult do you find it to obtain personnel with the required skill and qualification?

Very Difficult			Not Difficult	
1	2	3	4	5

20. Given the existing conditions and system, how difficult is it to motivate your staff members ?

Very Difficult			Not Difficult	
1	2	3	4	5

21. Is absenteeism a problem for your organization? Very Much

Very Much				Not at All
1	2	3	4	5

22. Have you noticed any frustration among some of your staff?

Yes No

If yes, what is the level of such frustration?

Very Much				Not Significant
1	2	3	4	5

23. How much difficulty do you face when you try to introduce some changes in the system/ process/ methods at your organization?

Very Much				Not Significant
1	2	3	4	5

24. Do you think that given the existing socio-political and organizational-managerial conditions there is enough room for you to 'innovate' and introduce 'change' at your organization.

Yes No Not sure

25. How flexible is your organization in adapting the changing environment?

Very Much				Not at All
1	2	3	4	5

26. Do you think that your subordinate staff members in general have a clear understanding of the board functional objectives and the goals of your organization?

Yes No Not sure

27. Do you feel that you have a secured job?

Yes No Not sure

28. All things considered, (cost of living & market factors, skill, education, experiences, ego need etc) are you satisfied with your pay?

Quite Satisfied Not satisfied

1	2	3	4	5
---	---	---	---	---

29. To what extent do you feel that recognition is given to your work and achievement?

Always given

Never

1	2	3	4	5
---	---	---	---	---

30. How do you feel about the pressure of work in your current position? (Tick/"/)

- () There is too much to do.
- () The amount of work is about right.
- () There is not enough to do.

31. How do you feel about your future prospects?

Very Good

Poor

1	2	3	4	5
---	---	---	---	---

32. Now, considering your job as a whole-how do you feel about your work, the organization, the pay, future prospects, people you work with, the working conditions, career opportunities etc. Taking all these into account, put a tick on the statement below that comes nearest to describe how do you feel about your job.

Like it very much

I do not like it

1	2	3	4	5
---	---	---	---	---

33. Have you felt that some further training would be of some value to you?

Yes No

If Yes, could you please write below what areas or subjects for which you would wish to receive such training.

- a)
- b)
- c)
- d)

- A
- abstract, 156
 - Abstract, i, 196
 - abstracts, 22
 - abuse of Research Findings, i, 48
 - acknowledgments, i, 111
 - Acquaintance with the Research, i, 108, *See*
 - Address Bar, i
 - AltaVista, i, 217
 - ALU, i
 - Analysis Plan, i
 - ANOVA, i, 169, 170, 173, 215
 - appendix, 111, 112, 178, 179, 191, 197, 200
 - Appendix, i
 - Apple, i, 203
 - Applied research, 51
 - Applied Research, i
 - Approaches of Research, i
 - Approaches to Knowledge, i, v, 17
 - Arrangement of materials, i, 190
 - Ask Jeeves, i
 - Assumptions of Sampling, i, vi, 116
 - Attributes of a Researcher, i
 - Availability of the Respondent, i
- B
- Bibliographical References, i
 - Bivariate statistics, 158, 215
 - book, ii, ix, x, 66, 83, 85, 87, 209
 - Byte/Bits, 208
- C
- card catalogue, 82, 83, 85
 - case study, 74, 75, 76, 183
 - categorization, 67, 69, 157, 164
 - Characteristics of the distribution, i
 - charts, 111, 146, 176, 191, 196
 - Checklist of Interview Session, i
 - Chi-Square*, 170, 212
 - Choice of research method, 64
 - Choice of Sampling Techniques, i
 - Chronological classification, 156
 - Classification of Data, vii
 - clinical significance, 173
 - Closed questionnaire, 136
 - Cluster sampling, 123
 - coefficient of determination*, 168
 - cohort study*, 58
 - Collection of Data, vi, 109
 - Components of Research Design, i
 - Computer, ii, vii, 203, 214, 223
 - Computer and Social Science, i
 - Concept, v, 26
 - conceptual framework, 34, 99
 - conclusion, 15, 27, 31, 87, 95, 110, 115, 190, 199
 - construct validity, 31
 - Construction of Tables, vii, 174
 - Constructionism, v, 19
 - Content Analysis, v, 65, 66, 67, 68, 69, 184, 221, 224
 - Content Validity, i
 - Continuous Variables, 32
 - Convenience Sampling, i
 - correlation coefficient*, 167, 168
 - CPU, 204, 205, 208
 - Creative Imagination, i
 - Cross-sectional research, 57
- D
- Data Analysis, vii, 150, 160, 163, 165, 215, 227
 - data and information, 14, 16, 25, 34, 41, 67, 70, 74, 81, 82, 109, 110, 130, 144, 145, 146, 149, 153, 156, 204, 217
 - Data Base Management, 207

- Data Collection, vi, vii, 129, 140, 141, 198, 224, 226
- Data Preparation, i
- Data Processing and Analysis, i
- data screening, 164
- Debugging software*, 207
- Dependent Variable, i
- Descriptive research, 54, 69
- Descriptive statistics, 159, 165, 215
- Determination of Sample Size, i
- Dewey Decimal Classification, 84, 85
- Diagrams, i
- Dimension in Research, v, 57
- directory, 209
- Discourse Analysis, v, 77, 78, 182
- discrete variables, 33, 174
- Dispersion*, 166
- Disproportionate Stratified Sampling, 121
- Dissemination of Research, v, 49
- Drawing Conclusions, vi, 110
- E
- Editing Data, vii, 154
- empirical research, 24, 25
- Empirical Variables, i
- Empiricism, v, 19
- epistemology, 18, 19, 20, 43
- Error in Observation Methods, i
- Errors in Interview Method, i
- Ethics, v, 47
- Ethnograph*, 216
- Experimental research, 53
- Explanatory research, 52, 53
- exploratory research, 26, 52
- external validity, 30, 31, 63, 82, 115
- Extreme Case Sampling, vi, 125
- F
- Face validity, 29
- facts, 13, 15, 16, 18, 20, 22, 24, 26, 27, 39, 40, 57, 65, 69, 70, 71, 72, 73, 74, 93, 95, 97, 108, 110, 133, 136, 155, 177, 189, 190, 193, 197, 214
- file, 123, 146, 204, 207, 209, 214, 215, 216
- File processing*, 207
- Findings and Results, i
- Flash Drive, 208
- floppy disk, 205, 208
- Focus Group Discussion, i
- focused synthesis, 78
- Footnotes, 176, 191, 192
- Foreword, 195
- Format of a Research Report, i
- Format of a Table, i
- Formulation of the Hypotheses, i
- Functions of Hypothesis, i
- future, 14
- G
- Geographical classification, i
- Google, 217
- graphs, 28, 146, 176, 212
- Grid system, 120
- group means, 170, 172
- H
- hard disks, 205
- Hardware, vii, 204
- Heterogeneity*, 117
- historical method, 72
- Homogeneity*, 117
- Hot deck imputation, i
- Hypothesis, vi, 95, 97, 102, 211
- I
- Identification, vi, 83, 87, 102, 105, 107, 134, 197
- Identification of the problem, i
- Identifying and coding missing, 164

- Illustrations, ii
 independent variable, 30, 31, 33, 36, 169, 170, 178
 index, 82, 85, 143, 169, 190, 196, 216
 Indicators, v, 34, 149
 Indifferent attitude, i
 Inductive and Deductive Reasoning, v, 26
 Inductive reasoning, 26, 27, 28
 Inertia of Large Numbers, i
 inferential statistics, 159, 165, 169, 170
Informative tables, 177
 Integration of Qualitative and, i
Internal validity, 29, 30
 Internet, vii, 13, 149, 217, 218, 219
 Internet Search Techniques, i
 Interpretation, vi, vii, 109, 160, 172, 181
Interpretivism, 63
 Interrelation of Theory and Research •, i
 interviews, 59, 66, 68, 73, 74, 109, 131, 132, 181, 184, 216
K
 keyboard, 204, 205, 206
L
 Lack of Awareness, i
 language, 63, 66, 68, 73, 77, 115, 133, 139, 156, 194, 195, 200, 204, 206
 Last value carried forward, i
 Law of Statistical Regularity, i
Layout, 192
 Library in Social Research, v, 82
 Library of Congress Classification, 85
 library research, 85, 86
 Limitation of Questionnaire Survey, 139
Limitations of Case Study, 77
 Limitations of Content Analysis, i
 Limitations of Descriptive Research, i
 Limitations of Historical Method, i
 Limitations of Social Research, v, 42
Logical positivism, 21
 Longitudinal Research, 58
 Lottery method, i
M
Mathematical functions, 35
 Measurement, vii, 156, 157, 225
 measures of association, 174
 memoirs, 73
Mental Astigmatism, 143
 Method, v, vi, 26, 63, 64, 69, 70, 71, 72, 74, 109, 132, 222, 223, 224, 225, 232
 Methodology, v, ix, 18, 63, 102, 111, 221, 222, 226, 227
 Methods and Techniques, i
Misreporting, 145
 Misuse in explaining social issues, i
 Mixed questionnaire, 136
 model building, 56
 Models of a Hypothetical Problem, i
 multi-stage sampling, 124
 Multi-stage sampling, 124
 Multivariate Regression Analysis, i
N
 Nature of Sampling, i
Nominal scales, 157
 Non-participant observation, 133, 134
Non-significance, 174
Non-Structured Questionnaire, 136

Number of Classes, 117

numbering, 192

O

Objectivity in Social Research, v, 43

Observation, vi, 133, 134, 225, 226

Observation method, 133

Ontology, 19

Open ended questionnaire, 136

Open Source, 217

Operating Systems, 206

Operational Definition, 34

Operational Definition, v, vi, 97

Operational definition of variables, 102

P

Panel Study, 58

personal computers, ix, 203, 208, 211, 212

Philosophy of Sciences and Knowledge, v, 18

photographs, 59, 216

Policy Research, 55

Positivism, v, 19, 20, 63

Post-positivism, 21, 22

Predicted mean imputation, 165

prediction, 23, 57, 63, 96, 170, 171

Preface, v, ix, 111

preparation, 41, 45, 80, 142, 188, 215, 231

Presentation, vii, 153, 176, 193

Pre-testing of a questionnaire, 138

primary sources, 72, 135, 139, 141, 143

Principle of authenticity, 88

Principle of authority, 88

Principle of Objectivity, 68

Principle of relevance, 88

Principle of Selection, 68

Principles of Questionnaire, 137

Printers, ii

privacy, 80, 142

Probability statements, 154

Problem, i, vi, viii, 102, 105, 106, 107, 108, 197, 224

Programmes, i

Projective Technique, vii, 141

Proportionately Stratified Sampling, 121

Public office Secrecy, 144

Published Official Data, 130

Purposes of Review of Literature, vi, 86

Purposive Sampling, vi, 123

Q

Qualitative classification, 156

Qualities of a Researcher, v, viii, 45

Quantitative classification, 156

Quantitative Methods, vii, 181

Questionnaire, vi, vii, 117, 135, 136, 137, 138, 139, 222, 225, 226, 229

Quota Sampling, vi, 124

R

RAM, 208

Random Sampling, 119

Random sampling, 119

Rationalism, v, 18

Recommendations, vi, 110, 199

Reference Sources, vii, 146

Regional Research Bodies, vii, 149

Regression, 170, 171, 212

Relational Research, 53

Reporting, vi, vii, 110, 187, 226

research design, 30, 31, 51, 75, 91, 92, 93, 101, 107, 153, 156, 198

Research Institutions, vii, 147

research methodology, ix, x, 16, 29, 39, 69, 156, 160

Research Process, viii

- Research Question, vi, 94
 Research, Theory and Knowledge, v, 22
 Review of Literature, vi, 86, 87, 197
 revision, 21, 188, 194
 ROM, 216
R-Square, 172
 S
Sample, vi, vii, 70, 115, 117, 227, 229
 sample design, 44, 102, 116, 200
 sample size, 92, 117, 118, 119, 168
Sampling population, 115
 Sampling theory, 115
 Scenario Building, v, 81
 Schedule, vi, 102, 139
 scientific methods, 14, 40
 Scientific reasoning, 21
 secondary sources, ix, 70, 72, 74, 82, 129, 141, 144
 Selected Methods in Social Research, v, 65
 Self-selected Sampling, 125
 Sequential List, 120
Sign-vehicle Analysis, 67
Simple tables, 177
Size of Questionnaire, 117
 Snowball Sampling, vi, 124
 Social Planning, 41
 Social Research, ii, v, vi, viii, 26, 39, 40, 47, 50, 105, 111, 221, 222, 223, 224, 225, 226, 227
 Software, vii, viii, 204, 206, 209, 211, 215, 216, 223
 Software Packages, i
Sources of Historical Data, 73
 Special purpose tables, 178
Sponsors of Research, 188
 Spreadsheets, vii, 212, 213
Statistical Distributions, 159
 Statistical Packages for Social Science, vii
Statistical power, 172
Statistical Validity, 31
 Statistics Software, 211
 Steps in Report Writing, vii, 188
 Stratified Sampling, vi, 120, 121
 Structured Interview, 131
 Sub-directories, 209
 Summary, 111, 177, 199
 Survey Data, 182, 183, 184
 Survey of Documents, vi, 129
 Survey Reports, 130
 System Unit, 208
 Systematic Sampling, vi, 122
 T
 Table of contents, 196
 Tables, viii, 176, 179, 191, 226
 Tables of figures, i
 Target population, i
 Text or Summary tables, i
 Theoretical Framework, vi, 101
 Theories in social science, i
 Theory, v, viii, 22, 23, 25, 26, 222, 223, 225, 226, 227
Time Perception, 142
 Time-Series Study, 58
 Title, 110, 191, 194, 195, 200
 Title page, i
Transforming Data, 164
 Travelogues, 130
 Triangulation, vii, 181, 182
T-Test, 169
 Type of questionnaire, 136
 Types of Table, 177
 U
 Understanding of Social Issues, i
 Unitization of data, i

UNIX, i

Unstructured Interview, 131

Utility of Sampling, 116

Utility of Social Research, 40

Utility Programmes, i

V

Validity, v, viii, 29, 30, 31, 68, 129,
173

Variable, v, vi, 32, 33, 97

VDU, i

Verbal Protocol, 141

W

Weighted Stratified Sampling, i

What is a Computer, 203

Y

Yahoo, i, 217

