

Chapter 02

CHAPTER OUTLINES

Introduction to Research

LEARNING OBJECTIVES

1. What is a research?
2. Define the classification of research
3. Qualitative and quantitative research?
4. Nomothetic and idiographic research
5. Inductive and deductive logic
6. Basic and applied research
7. Main types of research
8. Descriptive research
9. Correlational research
10. Applied research

- Introduction
- Definition
- **Classification of Research**
 - According to Approaches
 - According to Method
 - According to Logic
 - According to Purpose
- **Types of Research**
 - **Descriptive Research**
 - Observation
 - Self Report Measures
 - Surveys
 - Case Study
 - Action Research
 - **Co-relational Research**
 - Co-relational Observation
 - Co-relational Survey
 - Natural-group Design
 - **Experimental Research**
 - With-in-Group Design
 - Between Group Design
 - Mixed Group Design
 - **Applied Research**
 - Case Study
 - Single-subject (Small-n) Research
 - Quasi-Experiment
 - Action Research
 - Pilot Study
 - Replicated research
 - Important questions

Overview

You probably have read in chapter one that why psychologists or social scientists conduct research. Social research involves the study of behavior, mental processes, to test the theories, and hypotheses for use in academic settings and to improve the lives of people. Research psychology contains the areas of abnormal psychology, developmental psychology, biological psychology, cognitive psychology, personality psychology, comparative psychology, social psychology and many others fields. Research in psychology is conducted according to the standards of the scientific method and following the ethical standards.

Academic psychologists' central point is totally on research and psychological theory, trying to additional psychological understanding and other psychologists may work in applied psychology to organize such knowledge for useful benefits to improve the lives of people. However, these approaches are not equally restricted and mostly psychologists will be involved in both researching and applying psychology. Clinical psychology aims at rising in practice, psychologist's findings, knowledge, and experience with research will carry on construction up as well as employing as they treat individuals with psychological issues.

Social research is the scientific study of society to find out the facts and to describe the behaviors in natural settings. More exclusively, social research examines a society's behaviors, attitudes, assumptions, beliefs, trends, and rules. Popular topics of social research include social adjustment, racism, poverty and class issues, development of behaviors and attitudes, and criminal behavior.

Research;

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|---|-------------------------------|---|---------------------|---|
| <ul style="list-style-type: none"> • A process of collecting data through scientific methods is called research. • In the broadest sense of the words, the definition of research includes any gathering of data, information and facts for the advancement of knowledge (Shuttleworth, M. 2008). | | | | |
| <ul style="list-style-type: none"> • In general terms, scientific research consists of an investigation that: <table border="1"> <tr> <td>▪ Seeks answers to a question</td></tr> <tr> <td>▪ Systematically uses a predefined set of procedures to answer the question</td></tr> <tr> <td>▪ Collects evidence</td></tr> <tr> <td>▪ Produces findings that were not determined in advance</td></tr> </table> • produces findings that are applicable beyond the immediate boundaries of the study | ▪ Seeks answers to a question | ▪ Systematically uses a predefined set of procedures to answer the question | ▪ Collects evidence | ▪ Produces findings that were not determined in advance |
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| ▪ Collects evidence | | | | |
| ▪ Produces findings that were not determined in advance | | | | |

The Scientific Definition

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| <ul style="list-style-type: none"> • The firm definition of scientific research is performing a methodological study in order to confirm a hypothesis or answer a precise question. Finding an ultimate answer is the central goal of any scientific process. • In simple words research is scientific, systematic and organized process to find out the facts and to explore the reality. It also may used to test the theory. Research also means that you are going to add something new in previous work |
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Here;

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| <ul style="list-style-type: none"> • Scientific means research follows the principles of scientific method. • Organized in that there is an organization or method in going about doing research. It is a designed procedure, not an impulsive one. It is paying attention and restricted to an exact scope. • Systematic means because there is a specific set of steps which you will follow. There are definite things in the research process which are always done in order to get the mainly perfect results. |
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- **Finding Answers** is the last step of all research. Whether it is the answer to a hypothesis or even an easy question, research is victorious when we discover answers. Sometimes the answer is not found, but it is at rest an answer (Shaugnessy, J. *Research Methods in Psychology* 9th Ed).

Research is systematic and organized process whose center of attention is to solve a problem or to find the answer of question passing through different steps (later you will see all steps in chapter: 17). In research process the problem is logically organized and questions are devised about problem in systematic way. Hypothesis is formulated from research problem and research question and tested by observation (using induction or deduction method). Relevant data is collected and analyzed and true results (answer of definite question) are found. Research does not mean to make mere experiences and guesses but it is a set of process with different steps.

Characteristics of Research

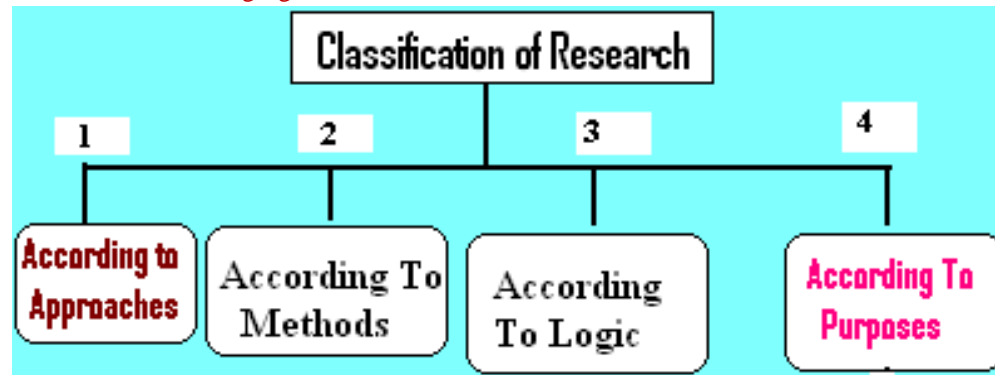
- It captures the natural occurrence.
- It determines the real creation.
- It grasps the scientific control.
- It identifies the regularities in social life by comparing and constructing data.
- It seeks to find clarification to unexplained social phenomenon.
- Follows the scientific and objective method
- Systematic collection of data
- Systematic interpretation of data

Objectives of Research;

- To make easy understanding of human behavior.
- To describe human behaviors and to increase academic knowledge.
- To test the theory or hypotheses and finding the solution of problems.
- To illustrate the phenomenon with some degree of confidence.
- To make prediction about phenomenon, events or behavior.
- To find out the natural laws that regulates or directs social phenomena.
- To regulate the society notion, e.g. culture, cohort gap, social detachment etc.
- To identify efficient association existing in a social phenomena.
- To devise solution to social problems.
- To maintain social organization, remove social stress, misapprehension.
- Helps illuminate doubts and correct misconception about facts of life.

Classification of Research

According to work and designs research has many types and comes in different forms. There are qualitative & quantitative research, basic & applied research, and inductive & deductive research.

Figure: 2.01 The following figure indicates the classifications of research**According to Approaches****Idiographic Approach**

This approach tends not to use inferential or descriptive statistics, but rather uses qualitative methods of data gathering such as interviews, diaries, and other written materials, obtained from or provided by the expected or anticipated respondents of a particular research. The term “idiographic” comes from the Greek word “idios” meaning “own” or “private”. (Carl Dellomos, 2009).

Idiographic approach includes a single subject in a study. Case study (clinical psychology), observational study, and single subjects experiment (conducted by behaviorists, gestalt school of thoughts and case studies are mostly conducted by dynamic psychologists e.g., Freud, Breuer, and many by other post-Freudian) are the examples of idiographic approach. This approach tends not to use inferential or descriptive statistics, but rather uses qualitative methods of data gathering such as interviews, diaries, and other written materials, obtained from or provided by the expected or anticipated respondents of a particular research.

Case-study (see chapter: 05) and single-subject experiments (see chapter: 10) are the examples of idiographic approaches.

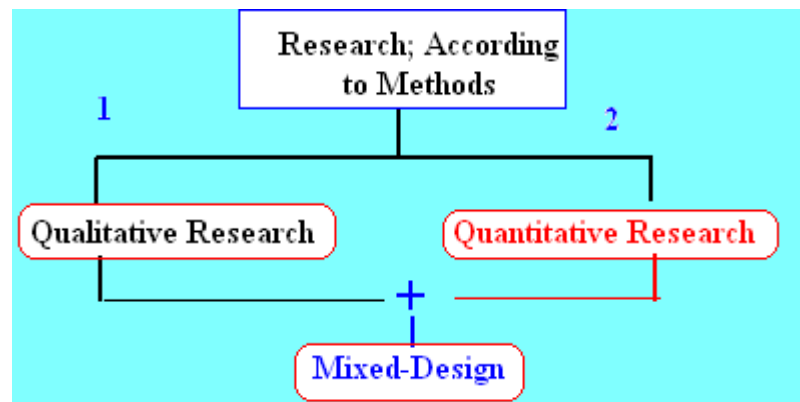
Nomothetic Approach

The term “nomothetic” comes from the Greek word “nomos” meaning “law”. Psychologists who implement this approach are mainly concerned with studying what we distribute with others. That is to say in establishing laws or generalizations (Carl Dellomos, 2009),

Nomothetic approach includes wide range of subjects or participant in the study and determined their performance on average basis using the normal distribution, measurement of central tendency, and measurement of desperation. Science in usually and psychology in exacting, use nomothetic approach for the description of behaviors, phenomenon and events. Using this approach psychologists make wide generalization and general laws. The average assessment allows researchers to predict that what an organism like in general. *Surveys researches, between group studies, quasi-experiments are the examples of Nomothetic Approach.* This approach essentially used inferential and descriptive statistics as both mediums of scientific method of research in analyzing, presenting, and interpretation of data, gathered by the researcher through identical or objective instruments (e.g. psychological Tests).

According to Methods (of Data Collection & Analysis)

Figure: 2.02: According to methods, there are two types of research; qualitative & quantitative and combination of both method the design is known as “Mixed-Design



Qualitative Approach

Qualitative Research emphasizes the understanding of social phenomena through direct observation, communication with participants, or analysis of texts, (Archivals). In Qualitative research social facts have subjective reality and subjectively measured. Qualitative researches are conducted to explore the issues, understanding of phenomena, and answering the questions, often using the unstructured (qualitative) data.

In qualitative research variable are complicated, composite, and not easy to measure, often uses inductive observation for data collection, the purpose of qualitative research is to supply insights into the setting of the problem, generating ideas and hypotheses for later quantitative research. To explore prevalent trends in thoughts attitudes, views, and opinions are the purposes of qualitative research. Unstructured or semi-structured techniques e.g. individual depth interviews or group discussions are tools in qualitative research (See the next chapter: Three & Fifteen).

Examples are the case study; the case can be an individual person, an event, a group, or an institution. Observation (naturalistic and field study) and historical research, Historical; Systematic collection and objective evaluation of data related to past occurrences in order to test hypotheses concerning causes, effects or trends these events that may help to explain present events and anticipate future events (Gay, 1996)

Quantitative Method

Quantitative research involves Numerical assessment of data, applying the statistical analysis to psychological research, and the development of new statistical approaches for measuring and explaining human behavior. It is a young field (only recently have Ph.D. programs in quantitative psychology has been started), and it is a combination of the subfields psychometrics and mathematical psychology.

Quantitative researches are pure in nature, mostly use statistical hypotheses testing, quantitative data gathering using structured and predetermined (using scales, questionnaires, and psychological test) and statistical methods mostly inferential statistics is use in quantitative data analysis. . We use interval and ratio scale of measurement to collect the data in quantitative research. Social facts are objectively evaluated and measured. Quantitative research begins with clear hypotheses, operational definition can be made easily, variable can be identified, and associations and relationships, prediction, and causation among variable are measurable. In quantitative research

generally a large number of cases representing the population of attention and Subjects are selected using random sampling. In quantitative approach researchers enumerate data and simplify and apply the findings from a sample to a population of interest. Surveys and experimental researches are the examples of quantitative research.

Mixed designs

Mixed design is a combination of Qualitative and quantitative methods of research. Sometimes Experimental and co-relational techniques are combined, the design called mixed design. Here participants who can be separated into precise populations (for example, schizophrenic versus normal) are assigned as groups to each experimental condition. In this way, variables such as psychosis or normality are not manipulated or induced by the investigator. Instead, they are correlated with the experiment condition.

Research According to Purposes;

Basic Research;

Also called Pure or Fundamental Research, it is mostly conducted to increase in knowledge by describing the behavior, event, and phenomenon. Basic research seeks primarily to understand behavior and mental processes. People often describe basic research as seeking knowledge for their own purposes. Basic research is also used to test a theory conducted in laboratory settings. There is no direct benefit because it is a research for the achievement of research. It is conducted to satisfy any interest such as: (a) what makes things occur, (b) why culture changes and (c) why societal relations are in a certain way. In fact, it is the foundation of most new theories, principles and ideas. Basic research infrequently helps anyone openly. It only stimulates new ways of thinking. The main motivation is to *enlarge man's information*. There is absolutely no profitable value to the discovery resulting from such research.

Applied Research;

- Research on creating changes is frequently called “Applied Research”
- It is use of basic research or past theories, knowledge and methods for solving a presented problem. It interacts with practical problems. It is different to pure research which is not problem-oriented but for the increase in knowledge which may or may not be used in future.
- In the nearby situation, more importance is being given to applied research to solve problems arising out of overpopulation and shortage of natural resources.

In applied research psychologists conduct research in order to change people lives for the betterment for misery mental disorders, to find out and treat the problems in organization settings. However applied psychologists are involved with many types of intervention including those aiming at the lives of students in school, employ at work and industrial in the community.

Table 2.01: Differences between Basic and Applied Research

Basic Research	Applied Research
Addition to Theoretical knowledge	Solution to Exciting Problems
Functions of advancement in knowledge	Common and familiar to community and public
Discovery/Invention mere Academics problems	Innovation/Application practical use in solving problems

Focuses Extensive (overall) in Nature	Focuses Intensive (On a Single Dimension) in Nature
Follows descriptive and experimental research methods	Follows the applied research methods, action research, and field experiment methods

Research According To Logic

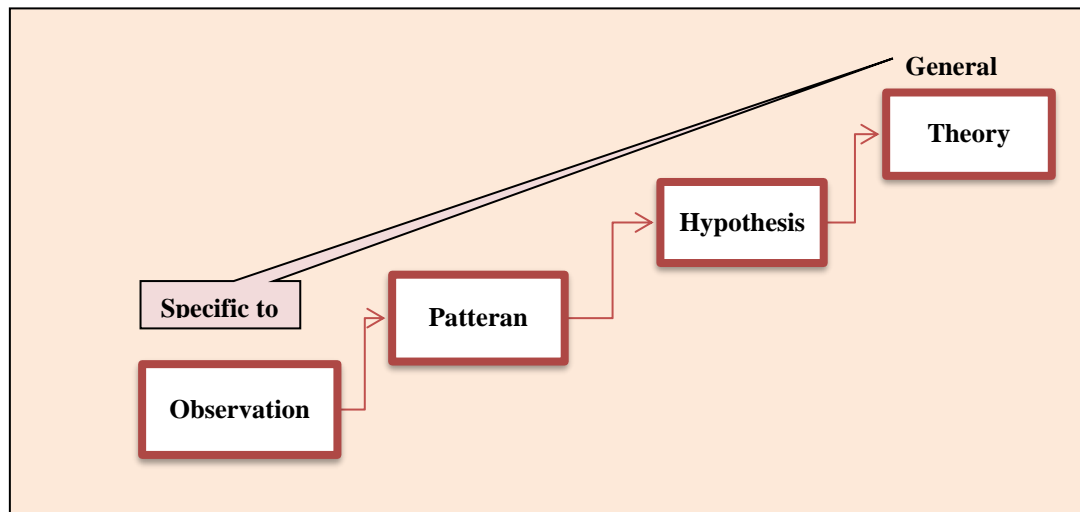
Logic is sequence and cycle use to formulate the hypothesis which later becomes the foundation or base for research. There are two types of logic use in research; inductive logic (sometimes called non-scientific and qualitative) and deductive logic (scientific and quantitative). Inductive and deductive logic are also called inductive and deductive reasoning and inductive and deductive methods; both inductive and deductive methods were given by a Greek philosopher “Aristotle”.

Inductive Logic (From Parts to Whole)

Greek philosopher Socrates provided the concept of inductive reasoning. Inductive reasoning is an exacting to common reasoning where the mental process is concerned in creating generalizations from the experimental occurrence or principles. It usually constitutes the three essential tools of thinking and is also called induction.

Inductive reasoning constructs and evaluates propositions that are abstractions of observations. It makes generalizations based on individual instances.

Figure 2.03: Logic of Inductive Method (Also called Lower to Upper-Specific to General)



The above given diagram shows logic of reasoning or observation which guides us to build a theory. The above diagram involves a journey from exact position “observation” to a wide-ranging termination “theory”. These are the ways of “theory construction” where precise facts are used to construct a theory that describes the links and relationships among the whole story and observable facts. So you probably already know that relationship between or among any things allow the researchers to make prediction about behavior or co-occurrence of events.

The Process and steps of Induction

Induction is a process of reasoning to formulate the hypothesis to guide the theory constructions or general premise.

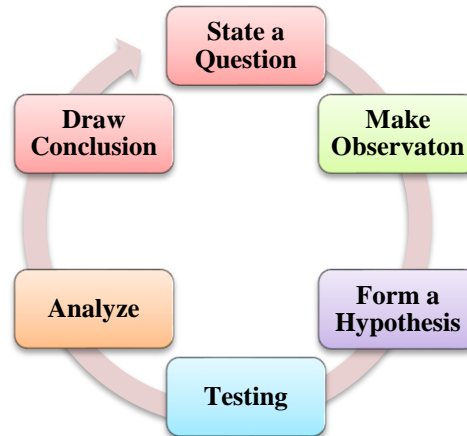


Figure: 2.04 The process and steps of induction

- **State the Question**
Think and state your question that what sorts of information do you wants to obtain.
- **Make Observation**
Observe the surroundings to collect and record the data which can help you to find the answers of your question.
- **Form a Hypothesis**
After the gatherings of data think, predict, and apply what you observe and form a hypothesis.
- **Testing**
Test your hypothesis by performing an experiment.
- **Analyze**
Check the results of your experiment to realize what they involve.
- **Draw Conclusion**
Based on the analysis of your results, develop a general principle as the answer of your question.

Here is an example:

- I am a man.
- I am vegetarian.
- Mostly men are vegetarians.

Though the above premises seem to be true, but may be vary because everyone would not like to eat vegetables by the refusal of doctors or due to any other reason. So this method is not entirely and always true. And we can say this is frail method than the deductive method (you will see the next method deductive method).

Another example is;

The integer 5 is an odd number and 7 is also an odd number, if we add to both values $5+7$ then result will be 12 in even. So the integer numbers 5 and 7 are specific and conclusion 12 is general.

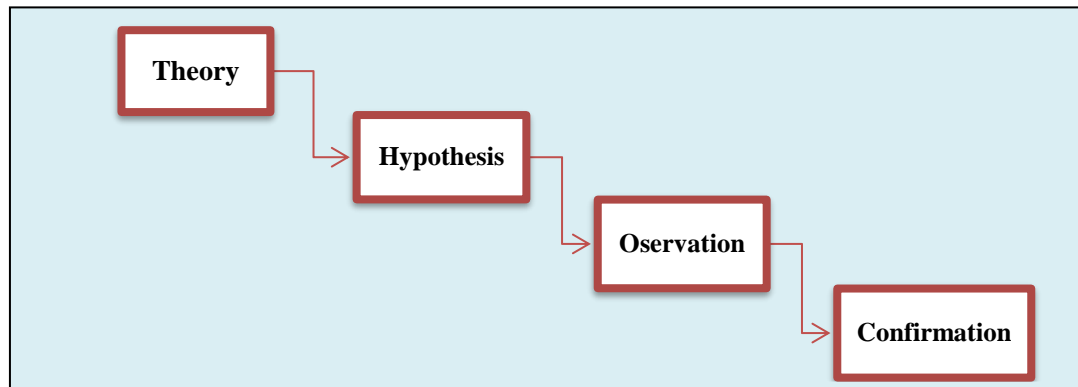
The inductive method is an effective process to obtain the observation-based general conclusion about the phenomenon or world. It is natural form of process to making the logical assumptions that what we observe. A correct inductive argument may have true premises and a false conclusion. Inductive method helps us;

- To understand that how logical conclusions are drawn
- To apply small, concrete ideas to larger abstract concepts
- To transfer principle and conclusions to new encountered information
- To develop problem-solving skills

Deductive Method (From Whole to Parts)

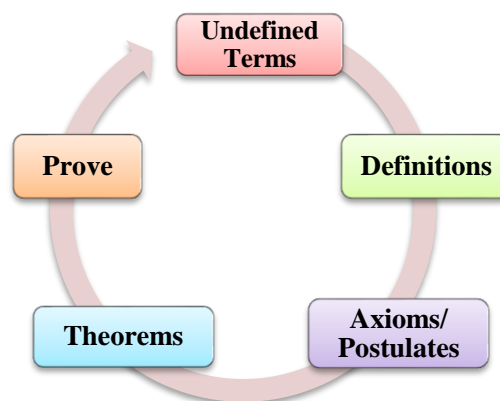
The deductive method is an approach to reasoning, which is based on assumptions and starts from a general point (theory) and illustrate a conclusion about something more specific (confirmation). Logic is used in the deductive method can be offered, officially or casually, in a diversity of different ways. One of the most general forms of the deductive method is the syllogism, in syllogism two restricted statements are given and from them a termination (confirmation) is drawn.

Figure 2.05: Logic of Deductive Method (Also called Upper to Lower & General to Specific).



Like Sherlock Hoolm the starting point is a given position and moving to a definite termination. All related information is assembled, studies to solve the secrecy. Greek philosopher “Aristotle” described that deduction as; “drawing conclusions by applying rules or principles; logically moving from a general rule or principle to a specific solution”.

Figure: 2.06 The process and steps of deductive method methods



- **Undefined Terms**

Start anywhere, with any meanings and statements, and choose common and self-evident terms and assume that “everyone is on the same page”.

- **Definition**

When you agreed on some undefined terms, use them to create definitions. When you will elucidate the undefined terms you will come on the point to create some definition about these terms.

- **Axioms/Postulate**

Simple and obvious true statements are called axioms or postulates. Your axioms should be minimum in numbers.

- **Theorems**

It is a time to combine the axioms, definitions, and un-defined terms with rules of logic to prove that other statements (theorems) must be true.

- **Prove/Confirmation**

When a theorem is proven then use it along with other proven theorems, axioms, and undefined terms to prove other theorems.

Following is an example;

- All men are human. (General no specific to one man)
- Socrates is man.
- (Therefore) Socrates is human (specific),

Table 2.02: Differences between Inductive and Deductive Methods

Inductive Methods	Deductive Methods
1: Inductive Method is less generalized.	1: Deductive Method is more generalized.
2: Inductive Method runs Specific to general.	2: Deductive Method runs General to specific.
3: Mostly starts from observation & ends on theory.	3: Mostly starts from theory & ends on confirmation.
4: Method includes focus a group, in-depth interviews, and reviews.	4: Methods includes Quantitative research like the 'Survey'.
5: More subjective: describes a problem or condition from the point of view of those experiencing it.	5: More objective: provides observed effects (interpreted by researchers) of a program on problems or conditions.
6: Deductive Method is Text-based.	6: Inductive Method is Number-based.
7: More in-depth information on a few cases.	7: Less in-depth but more breadth of information across a large number of cases.
8: Unstructured or semi-structured response option.	8: Fixed response option.
9: No use of statistical tests.	9: Use of statistical tests.
10: Can be valid and reliable: largely depends upon the skill and rigor of the researcher.	10: Can be valid and reliable: largely depends upon the measurement devices or instrument used.
11: Time expenditure lighter on the planning and heavier during the analysis phase.	11: Time expenditure and heavier on the planning phase and lighter on analysis phase.

Second Portion

Types of Research

There are many types of research, although the general types include medical research (pure scientific research) and social science research. These are the two major categories of research. According to the goals, objectives, and availability of time and participants, the research can have different types like; descriptive study (qualitative form and includes Observational study and Survey research), correlational study (co-relational observation & co-relational survey research), experimental Research (quantitative research to find the causation), and Applied Research (case study & Quasi-Experiments to apply the findings to improve the lives). These all types of research are used in both fields the medical science and social science.

Figure: 2.07 Following figure is illustrating the types of research according to the goals of scientific method.



Important Note:

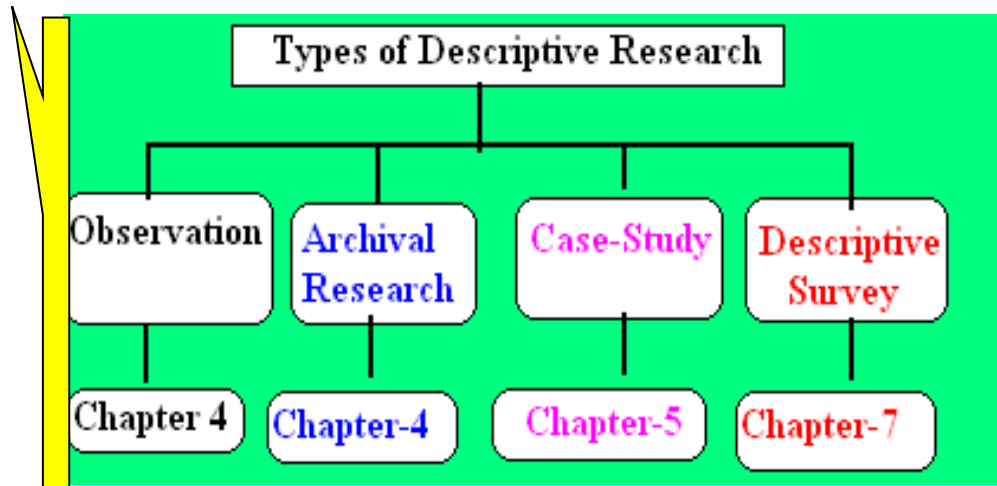
Above given types of research are according to the goals of scientific method and the topics given below under the types of research are the brief descriptions of research methods. The intensive description of each method will be given in next chapters.

Descriptive Research

The word descriptive derived from description, so descriptive studies are those which describe and try to understand the behavior. When there are lots of information already exists in nature about any topic and the purpose of research is to only explain the behavior, called descriptive research. Studies that do not manipulate specific variables, no controlled conditions and no laboratory settings are called descriptive studies. In this research method, all-purpose or precise behaviors or attributes are observed and assessed, without value to each other. These studies are usually the design of selection for flouting into new areas.

Examples of such a study are; a researcher curious to the quality of mental health institutions, what are the effects of illiteracy and poverty on the young generation? What are relations between mental health and traffic accident? These would be done by observation or measurements of various criteria, alternatively, the study could be conducted without any specific criteria in mind.

Figure 2.08: The types of descriptive research.



There are two types of information that we want. That is, there are two types of questions we want answered:

A. Description/Prediction: "What?"

B. Explanation/Understanding/Control: "Why?"

Description/Prediction	Explanation/ Control
What are people doing or viewing?	What causes (influences, makes) people to do or imagine what they do?
What is occurring?	Why is it occurring?
What do people do in a definite situation?	How can manipulating drugs, situations, or commands change people's behavior?
Answered simply by non-experimental/ descriptive/Correlational research.	Answered only via experiments.

Observation (Chapter: 04)

To seeing, watching, and listening carefully to someone or something for any purpose is called observation. The most basic and enveloping of all research methods is observation. When we call term observation, we generally its means that the naturalistic observation. Naturalistic observation is the most simple and best method for observing the behavior which naturally occurs. However according to advantages, disadvantages, limitations, goals, objectives, and time available for observation; we use different observational methods according to the purposes of study. Our every day observation is different in many ways those of scientists. When we observe carelessly, we may not attentive of factors that bias our observations. Moreover, we seldom keep proper records of our observations. Instead we rely on our memory of the events even though our own knowledge. The observations are done in a naturalistic setting without any grounding or participation of the researcher. Therefore, the behavior is observed at public places, streets, homes, and schools. Observing people from other cultures response in the same setting is a way to provide information for *cross-cultural research*. Therefore, the behavior is observed in public places, streets, homes, and schools. Observing people from other cultures response in the same setting is a way to provide information for *cross-cultural research*. Common types of descriptive observation are; Naturalistic Observation Field Study, and Archival (Unobtrusive Measures).

Case Studies (Chapter: 05)

In the course of treating a patient a psychologist will take records of problems, insights, and techniques that were important in the patients' treatment. A *clinical case history* may be pinched upon by researchers to interpretation a factor that is important for understanding a behavior.

When we conduct case studies we intensively observe and record the behavior of a single participant in an extended period of time. Because there are no guidelines for conducting a case study, the procedure employed, behaviors observed and reports produced may vary substantially. Case studies often provide interesting data; their results may be applicable only to the individual participant who was observed.

Surveys (Chapter: 07)

Surveys frequently used in different fields of social science as well as medical science, such as; psychology, economics, health, marketing sociology etc, both applied and descriptive. Survey research is a talented way of gathering data to deal with a research question. The main tackle is developing reliable and valid measurement tool (questionnaire or interview) that representative data and selection of representative sampling. The survey method of data collection is the most frequent of the four major methods. The compensation of this method is its low financial cost and its great sample size. The main problem with the survey research is its reliability, accurateness, and validity because there is a large difference among people's affirmed opinions and their expressed opinions. Survey assesses opinion, attitudes, and view point of people on a precise topic.

Survey may be precise and partial in scope or more worldwide in their goals. The best way to determine external validity of a survey "is to re-examine the survey procedure and analyses. The common methods of survey include; telephonic survey, mail survey, internet survey, and personal interview.

Correlational Research

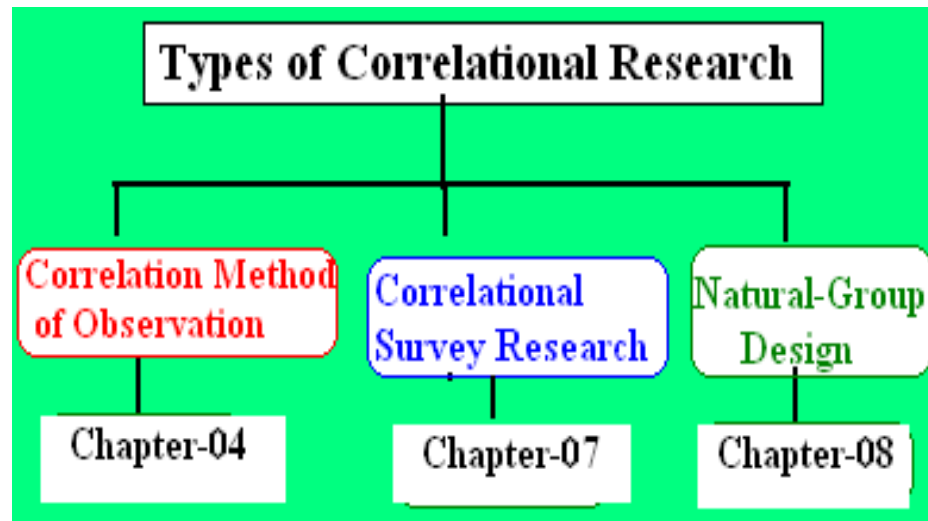
Co-relational Research examines the statistical association between two naturally occurring variables. This method of statistical analysis shows the relationship between two variables. The attributes of correlations include strength and direction. The direction may be positive (both variables both increase or decrease together), negative (one variable increases while the other decreases) or unrelated (a random relationship between variables). The strength of a correlation ranges from -1 to +1 with a zero, indicates no relationship between variables.

A correlational study serves only to describe/predict behavior but not to explain it and do not tells the causes of variables, events, or phenomenon. Furthermore, only experiments can prove causation.

Important Note:

Three methods of co-relational research are; Co-relational Method of Observation (See chapter: 04), Co-relational Method of Survey Research (See under the discussion of chapter: 07), and Natural Group Design (Chapter: 08. Experimental Method of Between-Group Design), to find the co-relation between natural (independent) variable and dependent variable

Figure 2.09: The following diagram will help you to understand and find the types of Co-relational Research



These methods are based on pure statistical method. In statistics we study the co-relation between two variables which lies between -1.00 to $+1.00$.

Co-relation may find in three conditions;

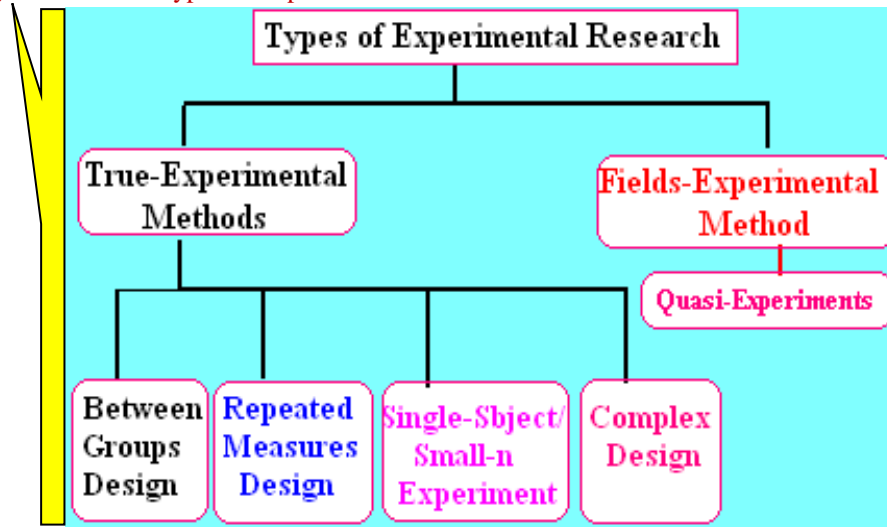
- **Positive Co-relation;** increase in one variable (*independent*) may increase the value of other (*dependent*) variable.
- **Negative Co-relation;** increase in one variable (*independent*) may decrease the value of other (*dependent*) variable.
- **No Co-relation;** increase or decrease in one (*independent*) variable

For example, research has shown that alcohol dependence correlates with depression. That is to say, the more alcohol people consume the more depressed they become. On the other hand, it could be the other way around as well: the more depressed people become, the more likely they are to consume alcohol.

Experimental Research (Part: 03)

Experimental psychological research is conducted in the laboratory under controlled conditions. These methods of research rely solely on an application of the scientific method and manipulation of variables to understand behavior and mental processes. The main advantage of experimental research is that it defines the cause of behaviors and events. Examples of such measurements of behavior include reaction time and various psychometric experiments on memory, sensation, perception, and learning. Experiments are conducted to test a specific hypothesis.

There are two types of hypotheses, *null* and *directional*. The null is a forecast that there will not be any change in the dependent variable when the researcher changes the independent variable. The directional hypothesis indicates that the change in the independent variable will induce a change in the dependent variable. In a true experiment, all variables are detained invariant except for the independent variable, which is manipulated. Researchers or psychologists conduct experiments to test a hypothesis about the cause of behavior. Experiments allow researchers to decide whether a treatment or program effectively change behavior.

Figure 2.10: Types of Experimental Methods**Logic of Experimental Research**

- Manipulation of independent variable.
- Experimental control allows researchers to make the informal inferences that the independent variable caused the observed changes in independent variable.
- To check the cause and effect.
- Experimental control can be gained through manipulation, asset conditions invariant and balancing.

Independent/Between Group design (Chapter: 08)

In this study two or more groups are compared. Group should be similar with help of balancing; there should be no differences between the groups. The groups are treated on the same time except for the levels of independent variable. Independent variable is manipulated on only one group (this group is called Experimental group) and no treatment is provided to other group (called control group). And at the end observation is taken from both groups and results are compared to justify the hypothesis (see Chapter: 08).

Dependent/within Group or Repeated Measure Design (Chapter: 09)

When we have few participants then we make one group and observe it before and after the manipulation of independent variable. It is more efficient to have each subject participates in all the conditions of an experiment this design is called repeated group design. Researchers choose to use a repeated measure design in order to

- Conduct the experiment more efficiently
- Conduct an experiment when few participants are available
- Increase the sensitivity of an experiment
- Observe the changes in subject's behavior over the time

Complex Design (Chapter: 11)

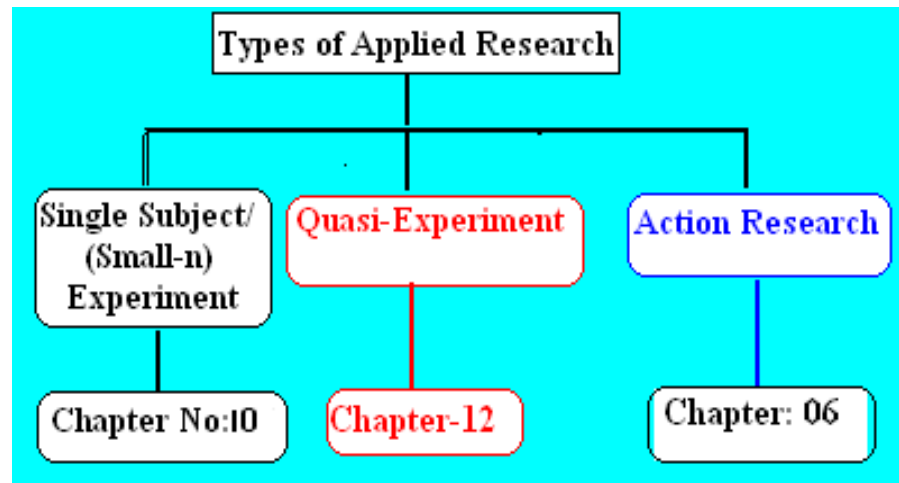
This design is combination or hybrid of both; Between Group design and Repeated Measure Design. When we want to observe the effects of two or more independent variables then we choose the *complex experiment design*. It is also called factorial design (see Chapter: 11).

Applied Research:

In applied research psychologists conduct research in order to change people lives for the betterment for misery mental disorders, to find out and treat the problems in organization settings. However

applied psychologists are involved with many types of intervention including those aiming at the lives of students in school, employ at work and industrial in the community.

Figure 2.11: The following figure showing the types of applied research



Single –Subject (Small-n) Experiment (True-Experimental Method & Applied)

Single-case design is a consequence of behavioral and operant approaches. It sets relationship to both experimental and case study method. In applied behavior study, the method develop within the experimental analysis of behavior are applied to socially related problems. Although it is pure-experimental methods in nature but its findings are applied on population that is why it is called applied research method. In small-*n*-research method we have one or very few subjects (2 to 5 or 8) and treatment (therapy, counseling or any program) is applied to see or observe its effects on behavior (dependent variable).

Quasi-Experiment (Field-Experimental Method & Applied Research)

A **quasi-experiment** is an empirical Research used to guesstimate the causal impact of interference on its target population. Quasi-experimental research contributes to similarities with the traditional experimental design but they specifically lack the element of random assignment to treatment or control group but in some cases, the researcher may have control over assignment to treatment condition. Quasi-experiment has lack of control over conditions that is found in true experiment. (For more details see part three and part four)

Other Types of Research

Action Research (Qualitative Method & Applied Research)

Action research is a qualitative method of research. In action research we manipulate any program, instructions, construction, or action in natural environment and see its effects on behavior of individuals, group, class, or society. Action research described as “proceeding in logical steps” and outcomes are manipulated. The action research is conducted to see the effects of manipulation (action) in natural environment (field) on behavior (because according to field theory behavior is function of person interacting with environment). For example a teacher manipulates new setting in classroom to see its effects on students’ behaviors. Another simple example is Prime Minister’s Laptop Scheme is an action to see the effects of advance technology on study (For more

understanding about Action Research please see the Chapter No. 06)

Pilot-Study

Pilot-study use one group and only pos-test measure. Pilot-study is mostly used in survey research. The main purpose of pilot-study is to pre-test the actual study in short time or to see the validity of new developed tool for data collection e.g., questionnaire, psychological test etc. pilot-study is a replica of main survey or a broad plan on a small-scale. It is a short and brief study using a small group of participants. Pilot-study (research) gives standard practice before the actual work.

The Notation of paradigm of pilot-study is same for case study; the difference is only that there is a one subject in case study and here is a one group of participants in pilot study. The notation of paradigm is: X-->>---O. Pilot-study is frequently used in survey research. Pilot study gives guidelines about the;

- The satisfactoriness of sampling frame
- The variability in the under-study population
- The expected non-response rate
- The validity and suitability of data collection tool
- The sufficiency of the instruction
- The sufficiency of questionnaire
- The expected cost and duration of actual study (research)

Replication Research

Replication means re-conducting or repeating the research with same procedure on different population or samples (of participants) and with different researchers or experimenters. The secondary data is mostly used for replication research. The *data is called secondary* if it has passed through with some statistical or mathematical operations.

Key Concept

Summary

Research is a systematic and organized process of data collection to test the hypothesis to find the answer of specific question. Objectives of research include; making easy understanding about human behavior, to describe the behavior, to predict about behavior, to explain the behavior, to explore the facts, to find out the reality (results), and to generalize the findings to the relevant population to make their lives better. We classified research into different categories. (1) Research, according to approaches is; idiographic approach of research (with single subject) and nomothetic approach of research (with many subjects). (2) Research according to method is; qualitative method of research and quantitative method of research. (3) Research according to logic is; inductive logic of research (specific to general) and deductive logic of research (general to specific). (4) Research according to purpose is; basic research and applied research.

Four main goals of scientific method are; description (to describe the behavior), Prediction (to predict about behavior), explanation (to explain the behavior), and application (to generalize the findings). Types of research according to the goals of scientific method are; (1: Descriptive research (survey research, observation, and case study method of research), (2) Correlational research (Correlational method of observation, Correlational method of survey, and natural-group experimental design), (3) Experimental research includes the true-experimental research (between-group design, within-group design, single-subject or small-n research, and complex design) and field experimental research (quasi-experiment and action-research). True-experimental research is conducted in laboratory under the controlled conditions while field-experimental research is conducted in natural setting with less control over conditions. For more understanding about the types of research see the part; 02 and part; 03 of this book.

Important Questions

1. What is a research?
2. What is the scientific definition of research?
3. Define the classification of research?
4. Define Qualitative and quantitative research?
5. Define nomothetic and idiographic research?
6. Define inductive and deductive logic?
7. Define basic and applied research?
8. Differentiate between basic and applied research?
9. What are the main types of research?
10. Define descriptive research?
11. What are methods of descriptive research?
12. Define correlational research?
13. What are the methods of correlational research?
14. Define experimental research?
15. What is the logic of experimental research?
16. Define applied research?
17. What are the research methods of applied research?
18. What do you mean by pilot study?
19. What do you mean by replication study?