SYLLABUS

B.Com. Hons III Year

Subject – Research Methodology

UNIT – I	Definition, Nature, Scope and Significance. Types of Research. Characteristics of a goods research.
UNIT – II	Research Process – Defining Research Problem, Title Formulation; Setting of Hypothesis, Research Design – Exploratory, Descriptive and Experimental Research Designs.
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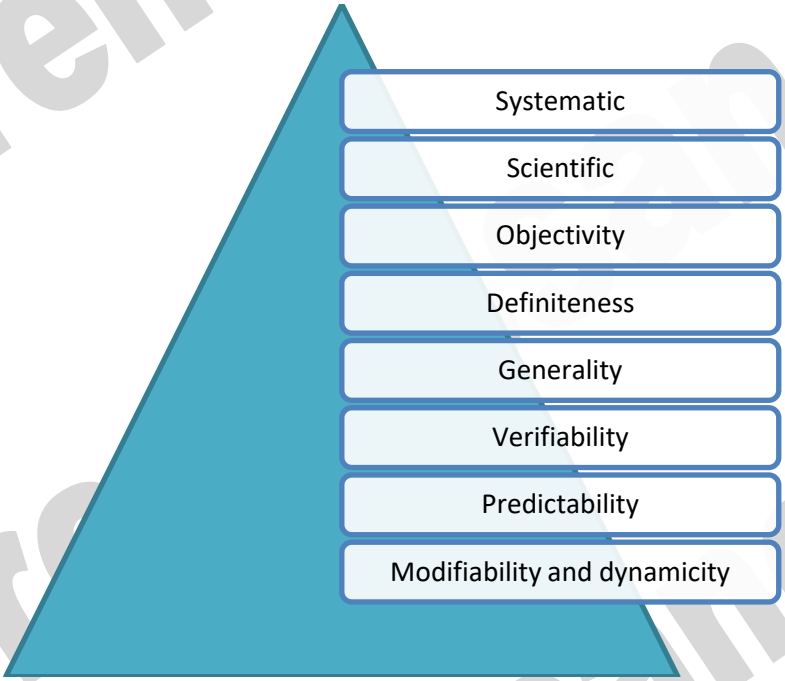
UNIT – IV	Measurement and Scaling, Methods of Collection of Primary and Secondary Data. Process of Questionnaire Design; Processing of Data – Editing, Coding, Classification and Tabulation.
	on of Appropria nd pothesis s Bas qua Test Intr du sult: R port Writing

UNIT – 1
MEANING & TYPES OF RESEARCH

Meaning:

1) It is a scientific and systematic search for pertinent information on specific topic.
2) It is an art and as well as science of investigationυ Research may be defined as a 'careful critical enquiry or examination in seeking facts or principles; diligent investigation in order to ascertain something'.
3) Research common sense of the term refers to a search for knowledge. Research is a part and parcel of human knowledge.
4) Gathering and analyzing a body of information or data and **extracting new meaning** from it or **developing unique solutions** to problems or cases.
5) A **report** or **review**, not designed to create new information or insight but to collate and synthesize existing information.
6) A search for **individual facts or data**. May be part of the search for a solution to a larger problem

Nature of research



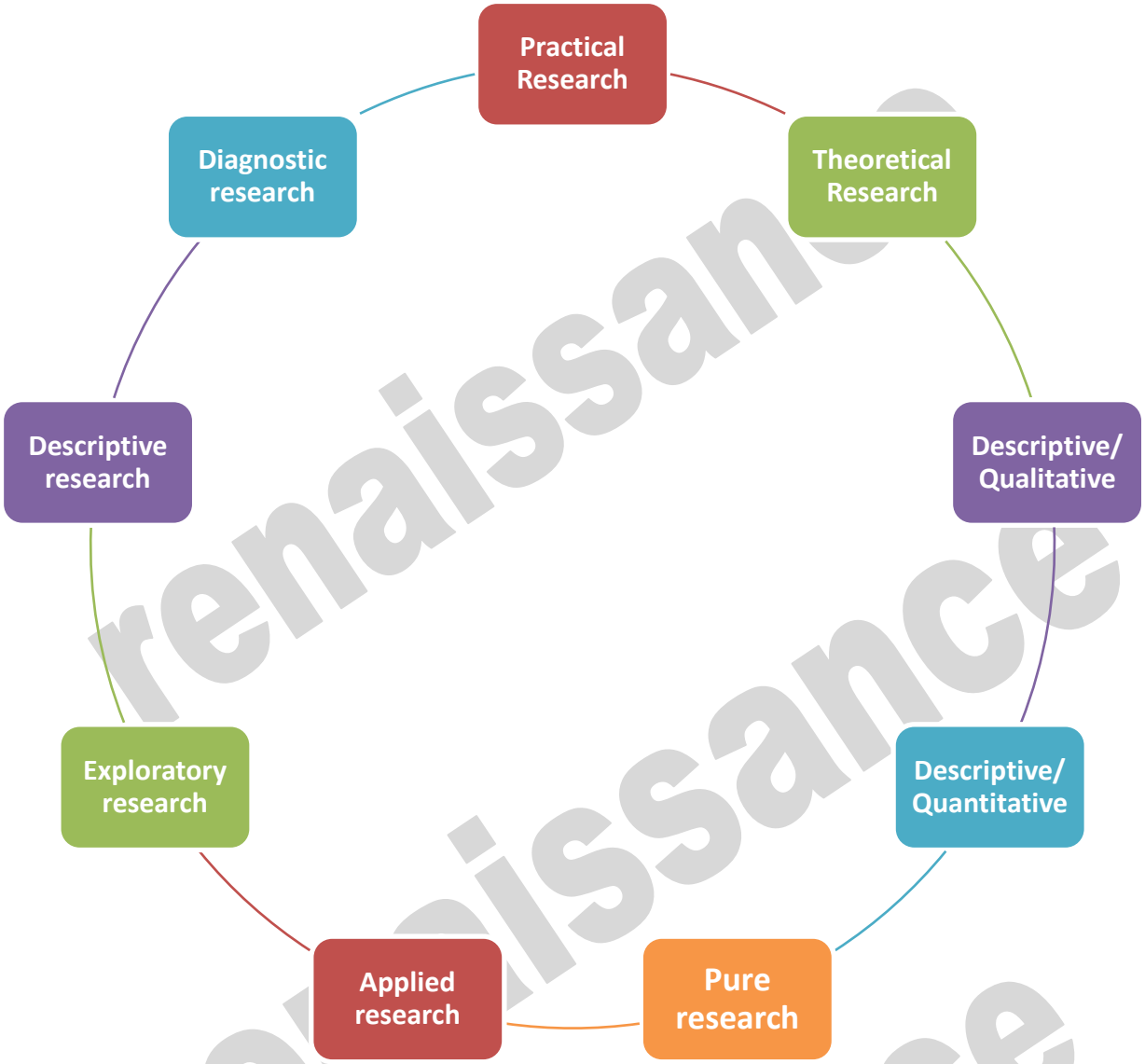
1. **Research is systematic and Scientific**- Research is a scientific and systematic search for pertinent information on a specific topic. • Generally, research has to follow a certain structural process.
2. **Research has objectivity** – Research is quite objective in its approach and is almost free from biases, prejudices and subjectivity.
3. **Research has definiteness** - Research is characterized by definiteness in its process as well as product. Here the modes and measures for (i) collection and organizing information or data and (ii) testing and verifying the collected information for arriving at the conclusion are all well planned and definite.

4. **Research has Verifiability**– Research lays emphasis on the proper verification of the collected information , data or facts. Here, nothing is accepted and derived unless verified through adequate observation, tests and experimentation.
5. **Research has Generality**– The conclusions or results derived from the scientific method show a marked characteristic of generality. First, it means that inductive reasoning and process is sued in making generalization and of the particular happenings or evens and secondly, the principles, laws and theories established through scientific method are quite universal having generalized application in similar situations.
6. **Research has Predictability**– The results obtained through scientific method are characterized with the ability of predicting the future outcomes of the things or events. In a given situation, under the known circumstances, what would happen to a person, object or phenomenon can be reasonably predicted through the properly derived conclusions or results of a scientific procedure.
7. **Research has modifiability and dynamicity**– The conclusion reached or results obtain through research are never final, absolute and static. They are always open to verification, observation and experimentation.
8. **Research has modifiability and dynamicity** – Consequently, what is true today in terms of the derived fact or reached generalization may be proved wrong tomorrow based on new findings. Therefore, research neither advocates rigidity in the process adopted for discovering the facts nor stands in the way of bringing desired modification and changes in the pre-established principles, laws or theories.

Significance of Research

- Research provides the basic for nearly all government policies in our economic system.
- The role of research in several fields of applied economics, whether related to business or to the economy as a whole, has greatly increased in modern times.
- Research inculcates scientific and inductive thinking and it promotes the development of logical habits of thinking and organization.
- According to Hudson Maxim Significance as, “All progress is born of inquiry. Doubt is often better than overconfidence, for it leads to inquiry and inquiry leads to investigation”
- Research is equally important for social scientists in studying social relationships and in seeking answers to various social problems. It gives intellectual satisfaction of knowing things for the sake of knowledge. It also possesses the practical utility for the social scientist to gain knowledge so as to be able to do something better or In a more efficient manner.
- Research has its special significance in solving various operational and planning problems of business and industry. In several ways, operations research, market research and motivational research are vital and their results assist in taking business decisions.
- Research provides the basis for nearly all government policies in our economic system.

Types of RESEARCH:



1) **Practical Research:** The practical approach consists of the empirical study of the topic under research and chiefly consists of hands on approach. This involves first hand research in the form of questionnaires, surveys, interviews, observations and discussion groups.
2) **Theoretical Research:** A non empirical approach to research, this usually involves perusal of mostly published works like researching through archives of public libraries, court rooms and published academic journals.
3) **Descriptive/Qualitative**: This type of research methods involve describing in details specific situation using research tools like interviews, surveys, and Observations. It focuses on gathering of mainly verbal data rather than measurements.
4) **Descriptive/Quantitative**: This type of research methods requires quantifiable data involving numerical and statistical explanations. Quantitative analysis hinges on researchers understanding the assumptions inherent within different statistical models. It generates numerical data or information that can be converted into numbers. The presentation of data is through tables containing data in the form of numbers and statistics.

5) Pure research

a. Also called as the fundamental or the theoretical research.
b. Is basic and original.
c. Can lead to the discovery of a new theory.
d. Can result in the development or refinement of a theory that already exists.
e. Helps in getting knowledge without thinking formally of implementing it in practice based on the honesty, love and integrity of the researcher for discovering the truth.

6) Applied research

a. Based on the concept of the pure research.
b. Is problem oriented.
c. Helps in finding results or solutions for real life problems.
d. Provides evidence of usefulness to society.
e. Helps in testing empirical content of a theory.
f. Utilizes and helps in developing the techniques that can be used for basic research.
g. Helps in testing the validity of a theory but under some conditions.
h. Provides data that can lead to the acceleration of the process of generalization.

7) Exploratory research

a. Involves exploring a general aspect.
b. Includes studying of a problem, about which nothing or a very little is known.
c. Follows a very formal approach of research.
d. Helps in exploring new ideas.
e. Helps in gathering information to study a specific problem very minutely.
f. Helps in knowing the feasibility in attempting a study.

8) Descriptive research

a. Simplest form of research.
b. More specific in nature and working than exploratory research.
c. It involves a mutual effort.
d. Helps in identifying various features of a problem.
e. Restricted to the problems that are describable and not arguable and the problems in which valid standards can be developed for standards.
f. Existing theories can be easily put under test by empirical observations.
g. Underlines factors that may lead to experimental research.
h. It consumes a lot of time.
i. It is not directed by hypothesis.

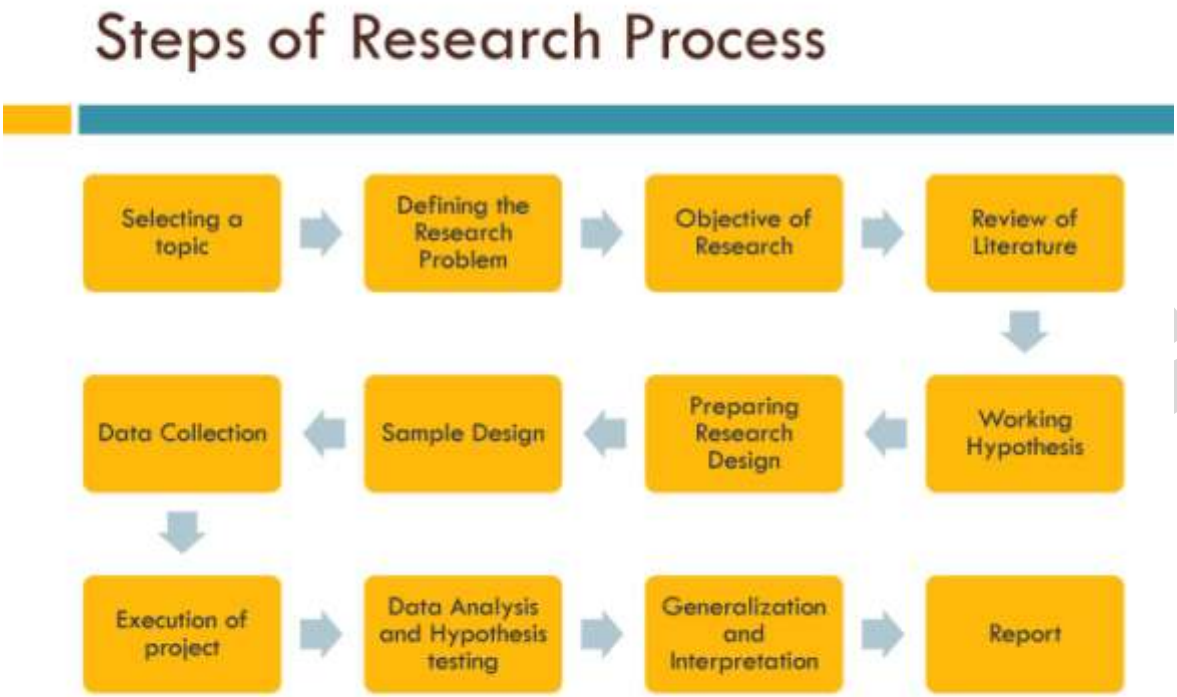
9) Diagnostic research

a. Quite similar to the descriptive research.
b. Identifies the causes of the problems and then solutions for these problems.
c. Related to causal relations.
d. It is directed by hypothesis.
e. Can be done only where knowledge is advanced.

Scope of Research

UNIT – 2
RESEARCH PROCESS

Research Process



1. Problem identification: The first step in a research process is to identify the problem or opportunity. The problem may be about decrease in sales, increase in competition, expansion of market, etc.

2. Problem definition: The second step in a research process is to define the problem. In this stage, the researcher must understand the problem correctly. He must find out the scope of the problem, the type of information needed, etc. If the problem is not defined properly, then it will result in waste of time, money and resources.

3. Research design: The third step in a research process is to prepare research design.
Research design is a plan for conducting a research. It guides the researcher in data collection. It gives proper direction to the research.
There are three types of research designs:

1. Exploratory research,
2. Descriptive Research and
3. Experimental Research.

All three types are used for marketing research.

4. Determining data needs: The fourth step in a research process is to determine the data needs. The researcher must consider the following issues:

1. Whether to use primary data or secondary data or both.
2. The accuracy and reliability of the data.
3. The availability of accurate and reliable data.
4. The cost and time required to collect the data.

5. Determining data sources: The fifth step in a research process is to determine the data sources. The researcher decides the sources of collecting data. The two main sources are secondary data and primary data. The researcher first collects secondary data. This is because it is easily available and less costly. It is collected by Desk Research. Desk Research can be internal for e.g. collected from company's records or external i.e. acquired from libraries, trade journals, government sources, etc. If the secondary data is not sufficient to solve the marketing problem, then primary data is wheeled.

Collecting primary data is very costly and time consuming. It can be collected by using survey methods, i.e. by doing personal interviews, telephone interviews and mail surveys. It can also be collected by using observational method and experimentation method.

So in this step the researcher decides what source and what method to use for collecting data.

6. Sampling design: The sixth step in a research process is of sampling design. The Researchers has limited time and other resources. So he cannot contact the total population. That is, he cannot collect information from all the people in the market. Therefore, he selects few persons from the population. These handful persons are called sample respondent. They are considered to represent the total population. The researcher collects data from the sample respondents. Sampling helps to save time, efforts and cost. It is used to collect primary data. The researcher has to decide about method of sampling, the size-of-sample, etc.

7. Designing questionnaire: The seventh step in a research process is of designing a questionnaire. In this stage, primary data is collected with the help of a questionnaire. So the researcher has to prepare a questionnaire. A questionnaire is a list of questions. These questions are asked to the respondents for collecting data. The questionnaire must be suitable so that the require data is collected easily, quickly and correctly. It is used for conducting person interview, telephone interviews and mail survey. The researcher must decide about the type of the information required, the type of questioned to be asked, the wordings of the questionnaire, its order, etc.

8. Field staff selection: The eighth step in a research process is of selecting field staff. After preparing the questionnaire, the researcher selects field interviewers. The field interviewers collect information from the respondents. They must be property trained. Students of psychology and statistics are good for this job.

9. Collection and processing of data: The ninth step in a research process is of collection and processing of data. In this stage, the data is collected from the respondents. The questionnaire is used for collecting data. In case of mail surveys, the questionnaire is sent to the respondents by post. In case of telephone interviews, the data is collected through telephone. In case of personal interviews, the data is collected by the field interviewers. The researcher can also use observation

method and experimentation method for collecting data. The data collected must be reliable and complete. It must also be collected quickly. Secondary data is also collected. The data collected is raw. It cannot be used directly. It has to be processed and organized neatly. That is, the data must be edited, coded, classified and tabulated. Editing helps to remove the unwanted data. Coding, classification and tabulation make the data ready for analysis and interpretation.

10. Analysis and interpretation of data: The tenth step in a research process is of analysis and interpretation of data. In this stage, the researcher analyzes and interprets the data. That is, he studies the data very careful and draws conclusions from it. These conclusions are then used to solve the marketing problem.

11. Project reporting: The eleventh step in a research process is to prepare a project report.
In this stage, the researcher prepares the final research report. This report contains a title of the report, method used, findings, conclusions and suggestions about how to solve the marketing problem. The language of the report must not be very difficult. The report must be submitted to the marketing executives for recommendations and implementation.

12. Follow up: Finally, the last step in a research process is to do a follow up.
In this stage, the marketing executive makes changes in the product, price, marketing policies, etc. as per the recommendations of the report. Here, the researcher should find out, whether his recommendations are implemented properly or not. He should also figure-out, whether the marketing problem is solved or not.

RESEARCH PROBLEM

Identification & formulation of Research Problem

The main steps in identification & formulation of research problem are:

1. Specify the Research Objectives

A clear statement of objectives will help you develop **effective research.**
It will help the decision makers evaluate your project. **It's critical** that you have manageable objectives. (Two or three clear goals will help to keep your research project focused and relevant.)

2. Review the Environment or Context of the Research Problem

As a marketing researcher, you must work closely with your team. This will help you determine whether the findings of your project will produce enough information to be worth the cost.
In order to do this, you have to identify the environmental variables that will affect the research project.

3. Explore the Nature of the Problem

Research problems range from simple to complex, depending on the number of variables and the nature of their relationship.
If you understand the nature of the **problem as a researcher**, you will be able to better develop a solution for the problem.
To help you understand all dimensions, you might want to consider focus groups of consumers, sales people, managers, or professionals to provide what is sometimes much needed insight.

4. Define the Variable Relationships

Marketing plans often focus on creating a sequence of behaviors that occur over time, as in the adoption of a new package design, or the introduction of a new product.

Such programs create a commitment to follow some behavioral pattern in the future.
Studying such a process involves:

- Determining which variables affect the solution to the problem.
- Determining the degree to which each variable can be controlled.
- Determining the functional relationships between the variables and which variables are critical to the solution of the problem.

During the **problem formulation** stage, you will want to generate and consider as many courses of action and variable relationships as possible.

5. The Consequences of Alternative Courses of Action

There are always consequences to any course of action. Anticipating and communicating the possible outcomes of various courses of action is a primary responsibility in the research process.

RESEARCH DESIGN

A **research design** is a systematic plan to study a scientific problem. The design of a study defines the study type (descriptive, correlational, semi-experimental, experimental, review, meta-analytic) and sub-type (e.g., descriptive-longitudinal case study), research question, hypotheses, independent and dependent variables, experimental design, and, if applicable, data collection methods and a statistical analysis plan. Research design is the framework that has been created to seek answers to research questions.

Confirmatory versus exploratory research

Confirmatory research tests *a priori* hypotheses—outcome predictions that are made before the measurement phase begins. Such *a priori* hypotheses are usually derived from a theory or the results of previous studies. The advantage of confirmatory research is that the result is more meaningful, in the sense that it is much harder to claim that a certain result is statistically significant. The reason for this is that in confirmatory research, one ideally strives to reduce the probability of falsely reporting a non-significant result as significant. This probability is known as α-level or a type I error. Loosely speaking, if you know what you are looking for, you should be very confident when and where you will find it; accordingly, you only accept a result as significant if it is highly unlikely to have been observed by chance.

Exploratory research on the other hand seeks to generate *a posteriori* hypotheses by examining a data-set and looking for potential relations between variables. It is also possible to have an idea about a relation between variables but to lack knowledge of the direction and strength of the relation. If the researcher does not have any specific hypotheses beforehand, the study is exploratory with respect to the variables in question (although it might be confirmatory for others). The advantage of exploratory research is that it is easier to make new discoveries due to the less stringent methodological restrictions. Here, the researcher does not want to miss a potentially interesting relation and therefore aims to minimize the probability of rejecting a *real* effect or relation, this probability is sometimes referred to as β and the associated error is of type II. In other words, if you want to see whether some of your measured variables could be related, you would want to increase your chances of finding a significant result by lowering the threshold of what you deem to be *significant*.

Sometimes, a researcher may conduct exploratory research but report it as if it had been confirmatory this is a questionable research practice bordering fraud.

Need and Importance of Research Design

Research design carries an important influence on the reliability of the results attained. It therefore provides a solid base for the whole research. It is needed due to the fact that it allows for the smooth working of the many research operations. This makes the research as effective as possible by providing maximum information with minimum spending of effort, money and time. For building of a car, we must have a suitable blueprint made by an expert designer. In a similar fashion, we require a suitable design or plan just before data collection and analysis of the research project. Planning of design must be carried out cautiously as even a small mistake might mess up the purpose of the entire project. The design helps the investigator to organize his ideas, which helps to recognize and fix his faults, if any. In a **good research design**, all the components go together with each other in a coherent way. The theoretical and conceptual framework must with the research goals and purposes. In the same way, the data gathering method must fit with the research purposes, conceptual and theoretical framework and method of data analysis.

A research design is like a successful journey:

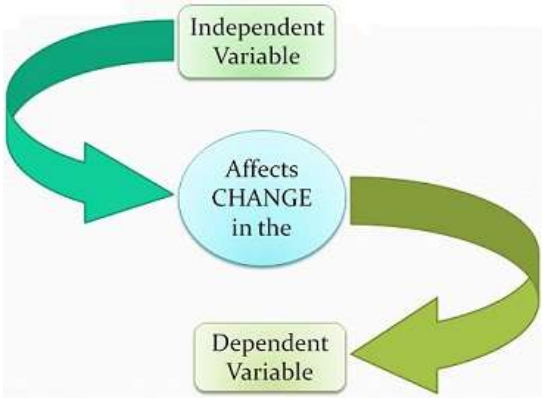
- Broadens your mind
- Provides fascinating & exciting experience
- Gives understanding of world around you
- Provides chance to meet people
- Gives fun and reward, but sometimes, very tedious & monotonous too.

The **importance of research design in research methodology** is due to the following:

- It may result in the preferred kind of study with helpful conclusion.
- It cuts down on inaccuracy.
- Allows you get optimum efficiency and reliability.
- Reduce wastage of time.
- Reduce uncertainty, confusion and practical haphazard related to any research problem.
- Of great help for collection of research material and testing of hypothesis.
- It is a guide for giving research the right path.
- Gets rid of bias and marginal errors.
- Provides an idea concerning the type of resources needed in terms of money, effort, time, and manpower.
- Smooth & efficient sailing (sets boundaries & helps prevent blind search)
- Maximizes reliability of results.
- Provides firm foundation to the endeavor.
- Averts misleading conclusions & thoughtless useless exercise.
- Provides opportunity to anticipate flaws & inadequacies (anticipates problems).
- Incorporates by learning from other people's critical comments & evaluations.

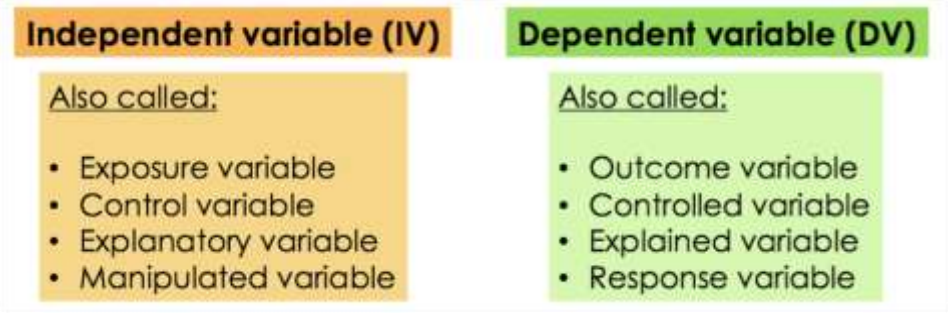
Variables & Types of Variables

When it comes to experiments and data analysis, there are two main types of variables: **dependent variables** and **independent variables**. It's easy to get these mixed up, but the difference between dependent and independent variables is simple. Here is a quick and easy definition of each one, along with some examples.



1) Dependent Variable: This is the output variable you are really interested in monitoring to see if it was affected or not. It can also be called the "measured variable," the "responding variable," the "explained variable," etc. I think it is easy to remember this one because it is *dependent* on the other variables.

2) Independent Variables: These are the individual variables that you believe may have an effect on the dependent variable. They are sometimes called "explanatory variables," "manipulated variables," or "controlled variables."



Example #1: Golf Balls

Here's a simple situation: Suppose you want to test golf ball flight distances, so you set up a simple experiment in which various golf balls are placed into a mechanical chute and fired into the air. The variable you really care about, the "output" or ***dependent variable*** is golf ball distance. ***Independent variables*** are the variables you are going to test to see how they affect distance. In this case, they are going to be things like air temperature, golf ball brand, and color of the golf ball. In the end, if you do a fancy regression analysis on all your data, you are going to end up with a formula that looks something like this: golf ball distance = 50 feet + air temperature factor + golf ball brand factor + golf ball color factor. See how all the independent variables (air temp, brand, color) have an effect on the dependent variable (distance)?

Example #2: Ice Cubes

Here's another simple example: Imagine that you have a bunch of ice cubes and you want to test how long it takes them to melt in various situations. You have an experiment with 1,000 equally shaped ice cubes. Some of them are made of frozen cranberry juice and some of them are frozen lemonade. You are going to set some of them on a metal sheet and others are going to be placed on a wooden plank. Air temperature, wind, and every other condition you can think of will remain constant. So, in this case, your ***dependent variable*** is ice cube melting time. Your two ***independent***

variables are: juice type (cranberry or lemonade) and melting surface (metal or wood). I'm not sure why anyone would care to do such an experiment, but hopefully the difference between the dependent and independent variables are clear now.

Hypothesis, Types & Formulation of Hypothesis

Introduction and Definition

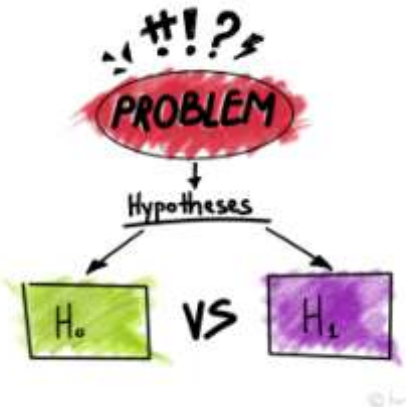
Hypothesis and the theories are generally responsible for the movement of knowledge from the unknown to the known. Hypotheses play a very important and a critical role in the assertion of a particular thing, as they are able to describe certain facts and are also able to explain the various relationships between these facts. As a result of this, hypotheses help a great deal in the investigation operations or activities.

On the institution of the problem to be answered in the process of the research, the researcher forms various tentative or possible solutions to these problems these proposed answers or the solutions are referred to as the hypothesis. But a very critical and essential point to be kept in mind here is that these propositions are not at all verified in nature.

So Hypothesis can be referred to as the interpretation of certain facts which is just a possible solution or a tentative answer to a problem and is completely or partly unverified in nature. Then afterwards on its establishment, it ceases to be a hypothesis and then finally becomes a theory or a principle. The word 'Hypothesis' has come from the Greek word hypo (means under)and tithenas (means to place) together these words indicate towards the support they provide to each other on the placement of the hypothesis under the evidence, which acts as a foundation.

According to George A Luniberg, hypothesis can be defined as a 'tentative generalization, the validity of which remains to be tested. In this elementary stage, the hypothesis may be very hunch, guess, imaginative data, which becomes the basis for an action or an investigation.'

A very vital point that should be kept in mind about the hypotheses is that these are not theories these only have some linkage to the theory but hypothesis is not that much elaborated as the theory is. But it can be said that the hypothesis is derived from the theory.



Role and Functions of the hypothesis

1. Helps in the testing of the theories.
2. Serves as a great platform in the investigation activities.
3. Provides guidance to the research work or study.

4. Hypothesis sometimes suggests theories.
5. Helps in knowing the needs of the data.
6. Explains social phenomena.
7. Develops the theory.
8. Also acts as a bridge between the theory and the investigation.
9. Provides a relationship between phenomena in such a way that it leads to the empirical testing of the relationship.
10. Helps in knowing the most suitable technique of analysis.
11. Helps in the determination of the most suitable type of research.
12. Provides knowledge about the required sources of data.
13. Research becomes focused under the direction of the hypothesis.
14. Is very helpful in carrying out an enquiry of a certain activity.
15. Helps in reaching conclusions, if it is correctly drawn.

Sources of hypothesis

1. Observations made in routine activities.
2. Theories based on the scientific approach.
3. Analogies.
4. Knowledge obtained from the functional executives.
5. Results of the research and development department.
6. Experience of the investigator.

Characteristics of hypothesis

1. Should be very specific in nature.
2. Concept of the hypothesis should be clear.
3. Should be empirically testable.
4. Should be related to the devices and the techniques that are available.
5. Should relate to the body of the theory.
6. Should recognize the specific variables and their relation

Problems faced during hypothesis formulation

Formulating a hypothesis is not at all an easy process and is faced with a large number of difficulties. According to Goode and Hatt, the various difficulties faced during the formulation of the hypothesis generally include the lack of the knowledge about the scientific approach of the method involved, as sometimes it becomes impossible to gather the complete information about a particular scientific method. One other major difficulty in the formulation of the hypothesis is the lack of clear theoretical background. Because of this problem of unclear and indefinite background of theory one is not able to arrive to a conclusion easily.

But with time answers to all such problems are available and these difficulties that arise during the hypothesis formulation can be easily removed by having complete and accurate information about the concepts of the subjects involved. Also the hypothesis should not be very long and should be timely in nature.