

# Research Methodology

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# Contents

- Research Methodology
- Research
- Differences between Research Method & Research Methodology
- Types of Research
- Main steps in Research
- Variable and its types
- Hypothesis and its types
- Research Design and its types
- sample and its types
- Source of Data collection
- Differences between Primary and Secondary data
- Data collection (tools & techniques)
- Data Analysis and data interpretation
- Processing of data
- Test of Hypothesis
- Type 1 error & Type 2 error

# Research Methodology

**Research methodology** is the specific procedures or techniques used to identify, select, process, and analyze information about a topic.

## Research

**According to John W. Creswell who states that “Research is a process of steps used to collect and analyze information to increase our understanding of a topic or issue”.**

It consists of three steps: pose a question, collect data to answer the question, and present an answer to the question.

## Difference Between Research Methods and Research Methodology

### **Research Methods**

- **The various ways and means of conducting a research that involve the conduct of experiments, tests, surveys and the like.**
- **Aims at finding solutions to research problems**

### **Research Methodology**

- **The science of systematically solving a research problem**
- **The learning of the various techniques we can use in the conduct of research.**

# Types of Research



Criteria	Types		
On the basis of Objectives	Fundamental Research	Applied Research	Action Research
On the Basis of Nature of Data	Qualitative Research	Quantitative research	
On the basis of Nature of Findings	Explanatory Research	Exploratory Research	Descriptive Research
On the basis Experimental manipulations	Experimental Research	Non-Experimental Research	
On the basis of approach involved	Longitudinal Research	Cross Sectional Research	

# Main Steps in conducting research

## 7 STEPS OF RESEARCH PROCESS

- Step One: Define research problem
- Step Two: Review of literature
- Step Three: Formulate hypotheses
- Step Four: Preparing the research design
- Step Five: Data collection
- Step Six: Data analysis
- Step Seven: Interpretation and report writing

# Variable and its types

The first variable is called the **independent variable**. This is the part of the experiment that can be changed and tested.

The independent variable happens first and can be considered the cause of any changes in the outcome.

The outcome is called the **dependent variable**. The independent variable in our previous example is not studying for a test. The dependent variable that you are using to measure outcome is your test score.



# Hypothesis

A **hypothesis** is a specific, testable prediction. It describes in concrete terms what you expect will happen in a certain circumstance.

The **null hypothesis**, symbolized by  $H_0$ , is a statistical hypothesis that states that there is no difference between a parameter and a specific value, or that there is no difference between two parameters.

The **alternative hypothesis**, symbolized by  $H_1$ , is a statistical hypothesis that states the existence of a difference between a parameter and a specific value, or states that there is a difference between two parameters.



# Research Design

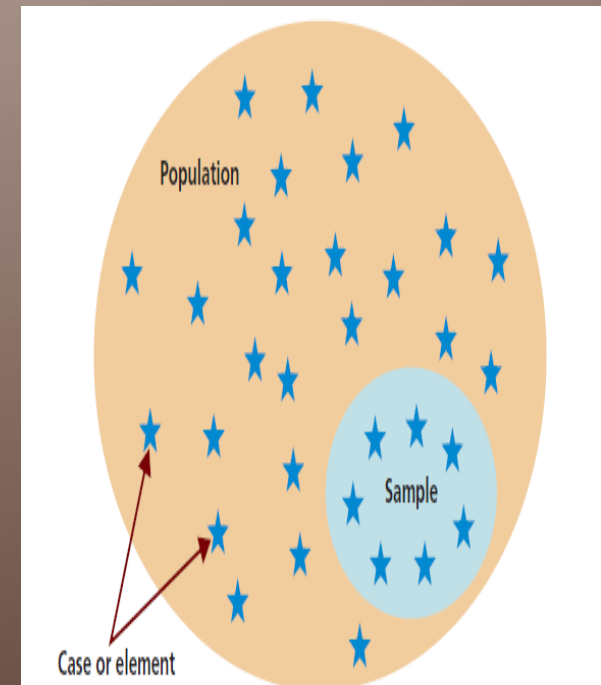
The **research design** refers to the overall strategy that **you** choose to integrate the different components of the study in a coherent and logical way, thereby, ensuring **you will** effectively address the **research** problem; it constitutes the blueprint for the collection, measurement, and analysis of data.

## Types of Research Design

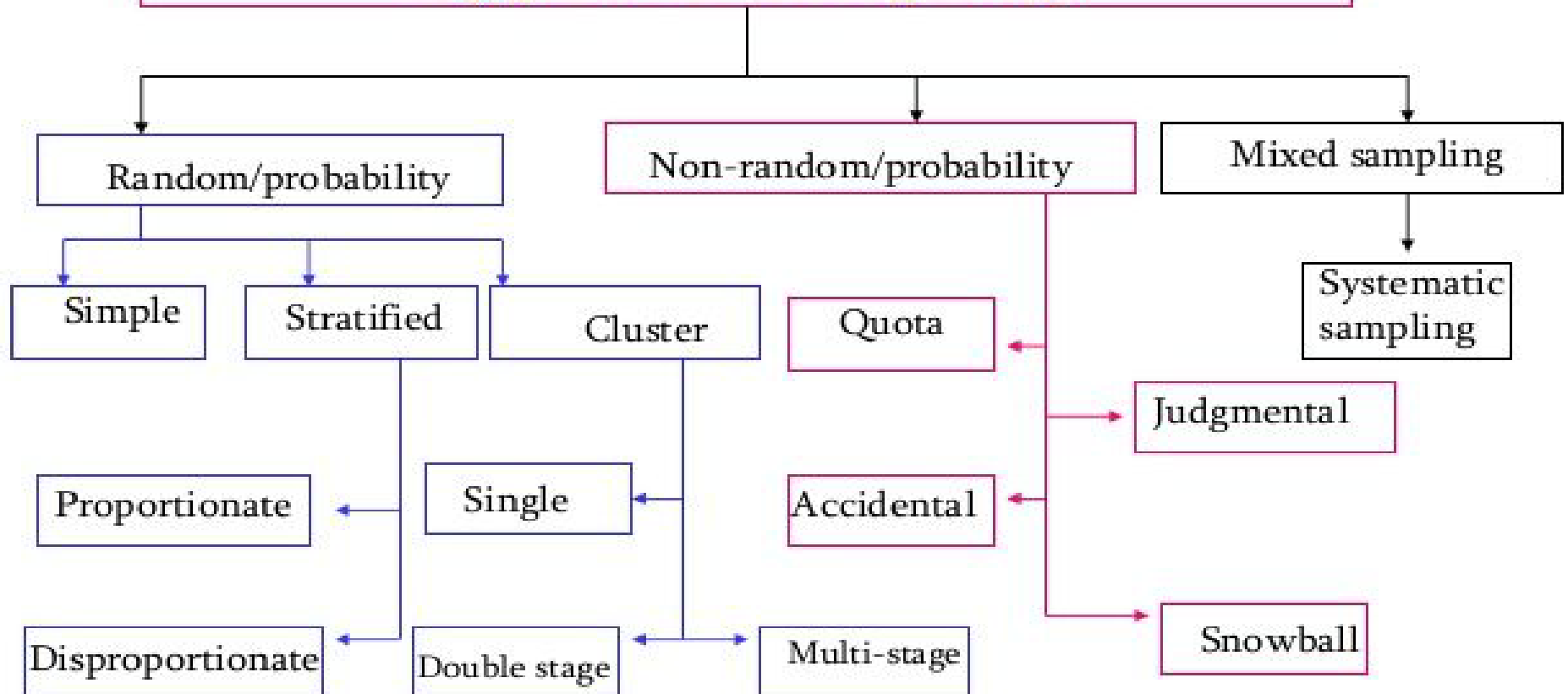
1. **Explanatory**
2. **Descriptive**
3. **Diagnostic**
4. **Experimental**

# Sample

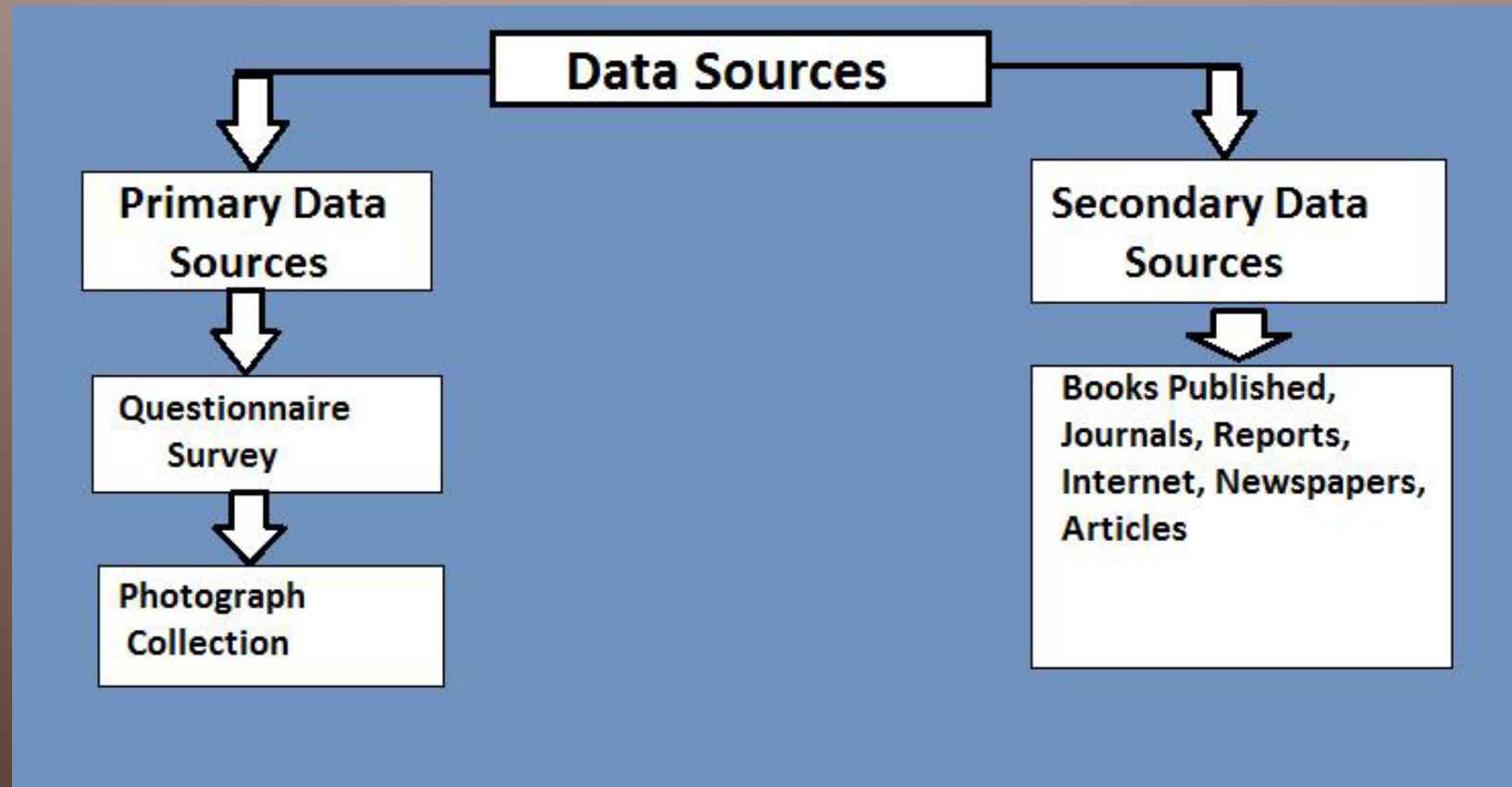
A **sample** refers to a smaller, manageable version of a larger group. It is a subset containing the characteristics of a larger population.



# Types of sampling



# Source of Data collection



# Difference b/w primary and secondary data

## Primary data

- ▶ Real time data
- ▶ Sure about sources of data
- ▶ Help to give results/ finding
- ▶ Costly and time consuming process
- ▶ Avoid biasness of response data
- ▶ More flexible

## Secondary data

- ▶ Past data
- ▶ Not sure about of sources of data
- ▶ Refining the problem
- ▶ Cheap and no time consuming process
- ▶ Can not know in data biasness or not
- ▶ Less flexible

# Data collection tools & techniques

## TOOLS

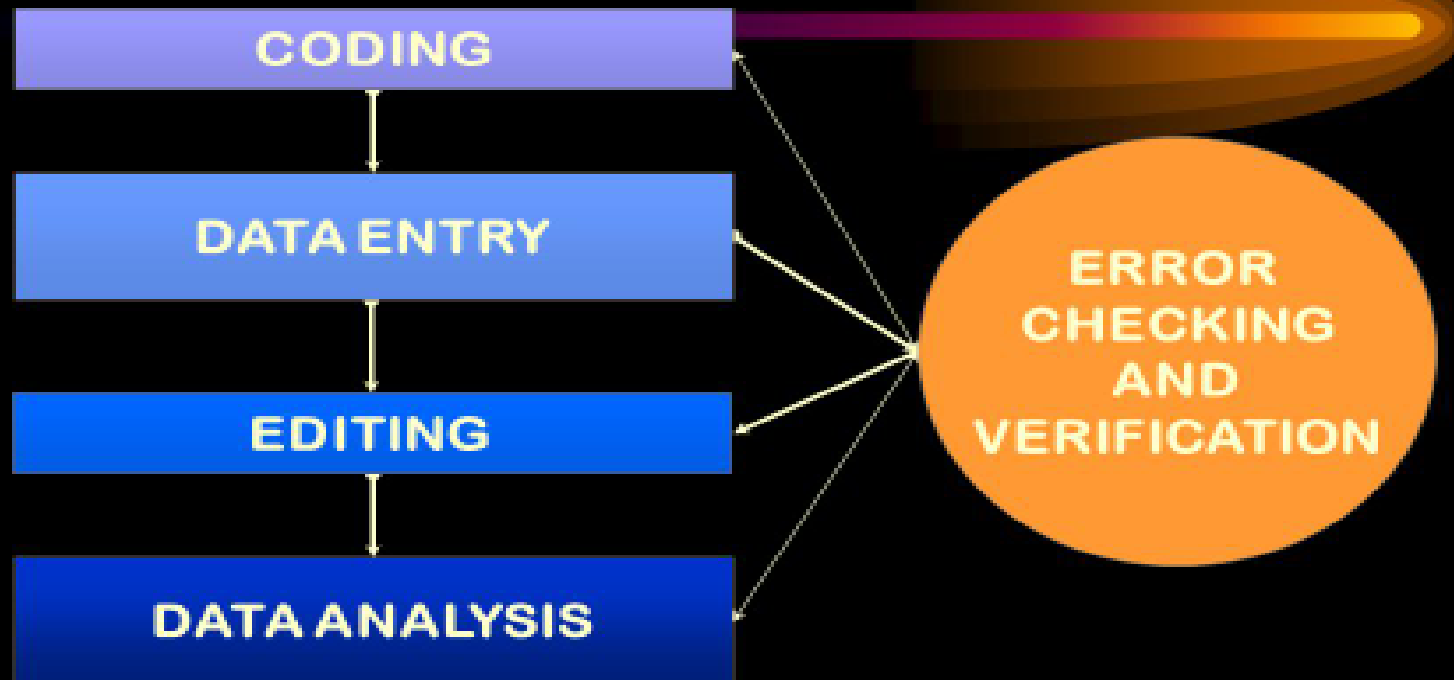
- Questionnaire
- Interview schedule
- Observation schedule
- Scales
- Tests
- Inventory, Checklist, Opinionnaire
- Sociogram/Sociometry

## TEHNIQUES

- Questioning: Written, Oral
- Interviewing: Face to face, Telephonic, Electronic/Net, Group, Video
- Observation
- Projective Techniques
- Panel Methods (Diary, Checklist, Logs etc.)

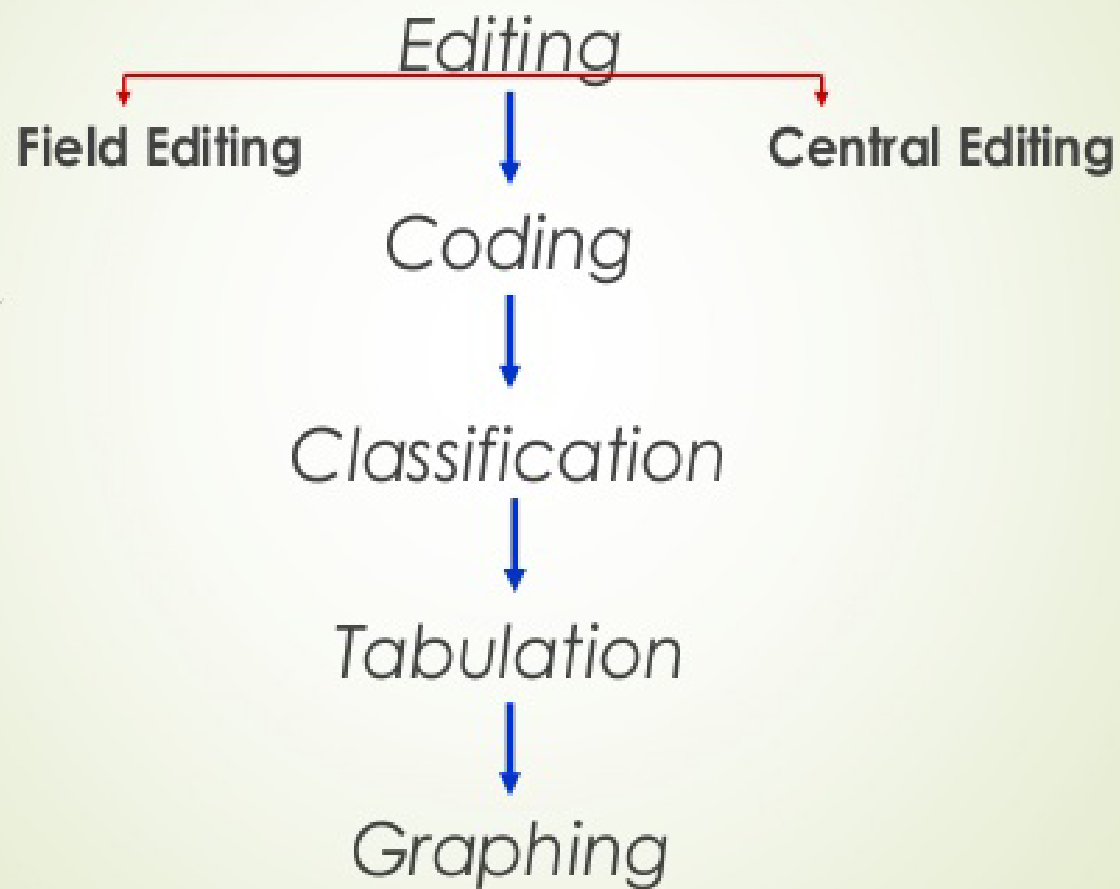
# Data Analysis

## *Stages of Data Analysis*





# Processing the data

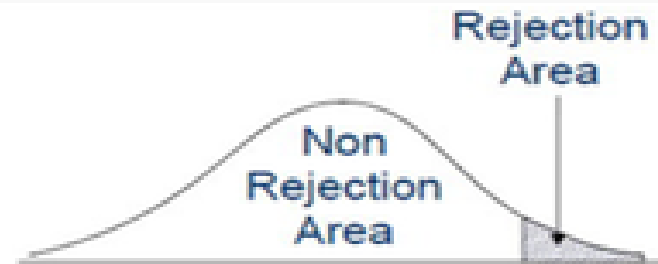


# TEST OF HYPOTHESIS

## ❶ One-tailed (directional)

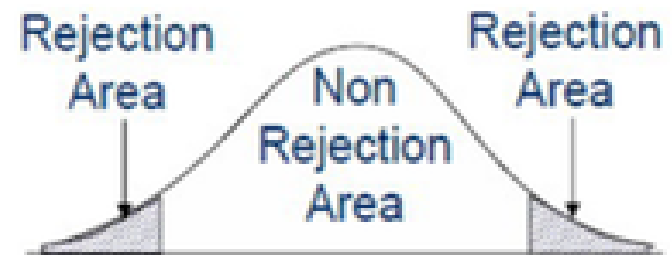
$$H_A: \rho > 0$$

$$H_A: \rho < 0$$



## ❷ Two-tailed (non directional)

$$H_A: \rho \neq 0$$



**Type 1 Error:** We may reject the null hypothesis when it is, in fact, true. This occurs when we think there is a difference between our groups, but there really isn't. We can minimise this possibility by selecting an appropriate alpha level .

**Type 2 Error:** Type 2 error occurs when we fail to reject a null hypothesis when it is, in fact, false (i.e. believing that the groups do not differ, when in fact they do).

		<b>Hypothesis</b>	
		$H_0$ True	$H_0$ False
<b>Decision</b>	Reject $H_0$	Type I Error	Correct Decision
	Fail to Reject $H_0$	Correct Decision	Type II Error

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THANK YOU