LECTURE
ON
Ph.D. COURSE WORK
Research Hypothesis

BY

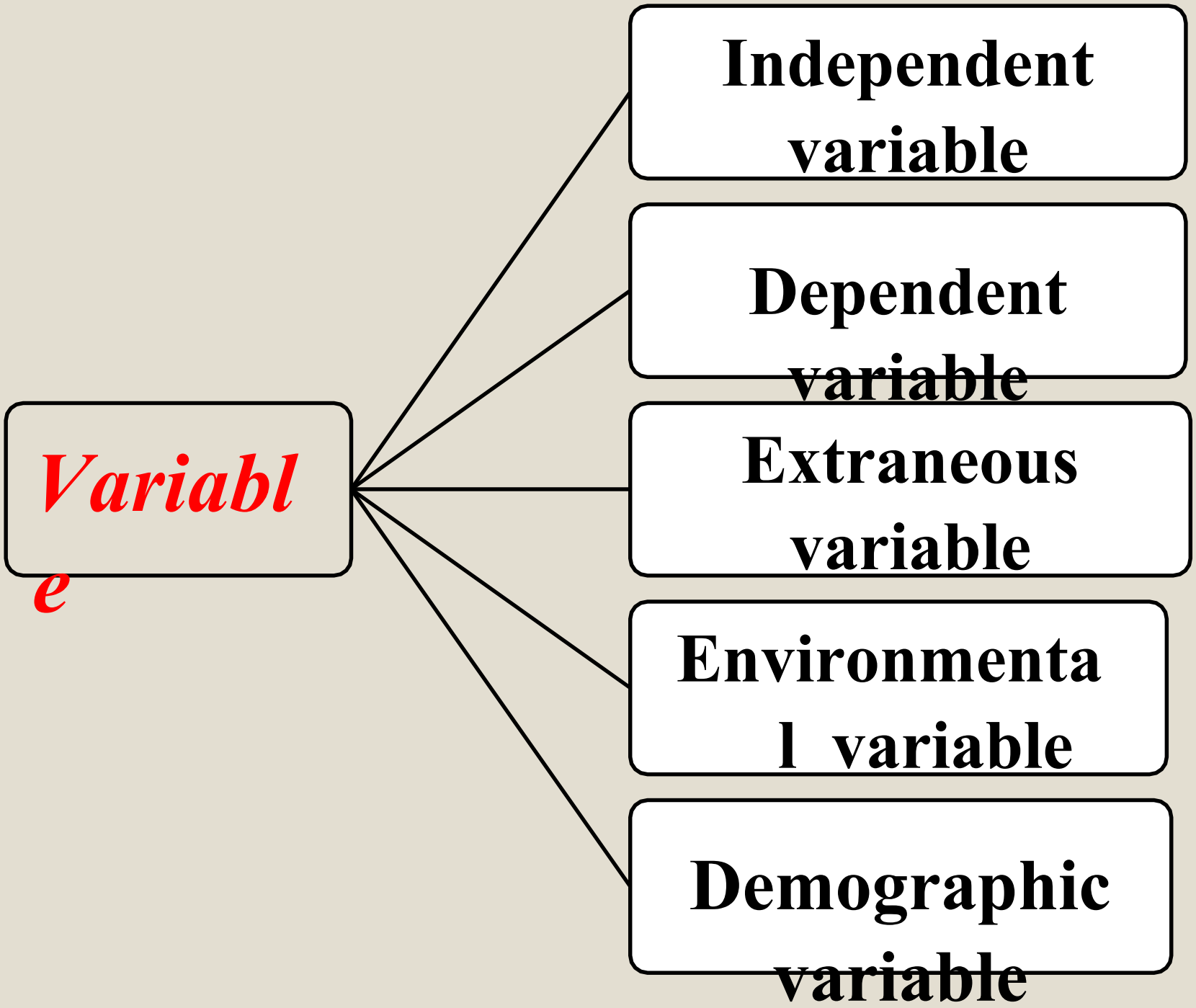
PROF. (DR) NARESH KUMAR

UNIV. DEPARTMENT OF CHEMISTRY

B. N. MANDAL UNIVERSITY, MADHEPURA

- A hypothesis is a formal tentative statement of the expected relationship between two or more variables under established facts, laws.
- Research variables are defined as qualities, properties, characteristics, behaviors, attributes etc. of people-individuals or group, objects, situations, activities etc. That changes or vary. Variable are **manipulable** and measurable.
- A hypothesis helps to translate the research problem and objective into a clear explanation or prediction of the expected results or outcomes of the study.

Type of *Research Variables*


Variable
Independent variable
Dependent variable
Extraneous variable
Environmental variable
Demographic variable

Independent variable

- Independent variable is the quality or property that can be **manipulated** by the researcher to **cause** an **effect** on the dependent variable. It is also called experimental variable or treatment variable.

Dependent variable

- Dependent variable is the quality or property or behavior or outcome that the researcher predicts and that occurs in response to the manipulation, experimentation or treatment of the independent variable. It is also called outcomes variable.

- Hypothesis is derived from the research problems, literature review and conceptual framework.

- Hypothesis in a research project logically follow literature review and conceptual framework.

Hypothesis makes the following contributions in research study

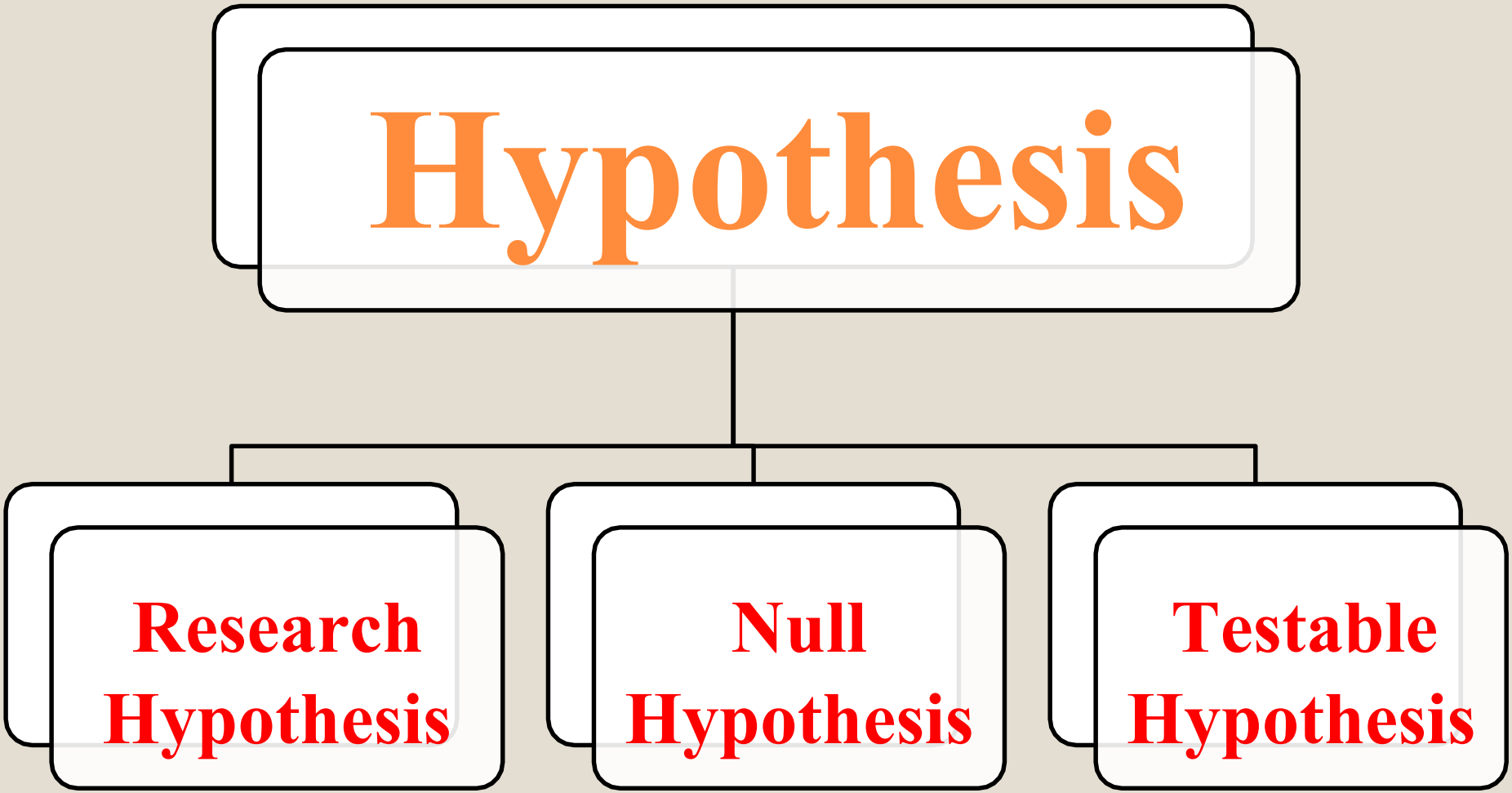
Cont…

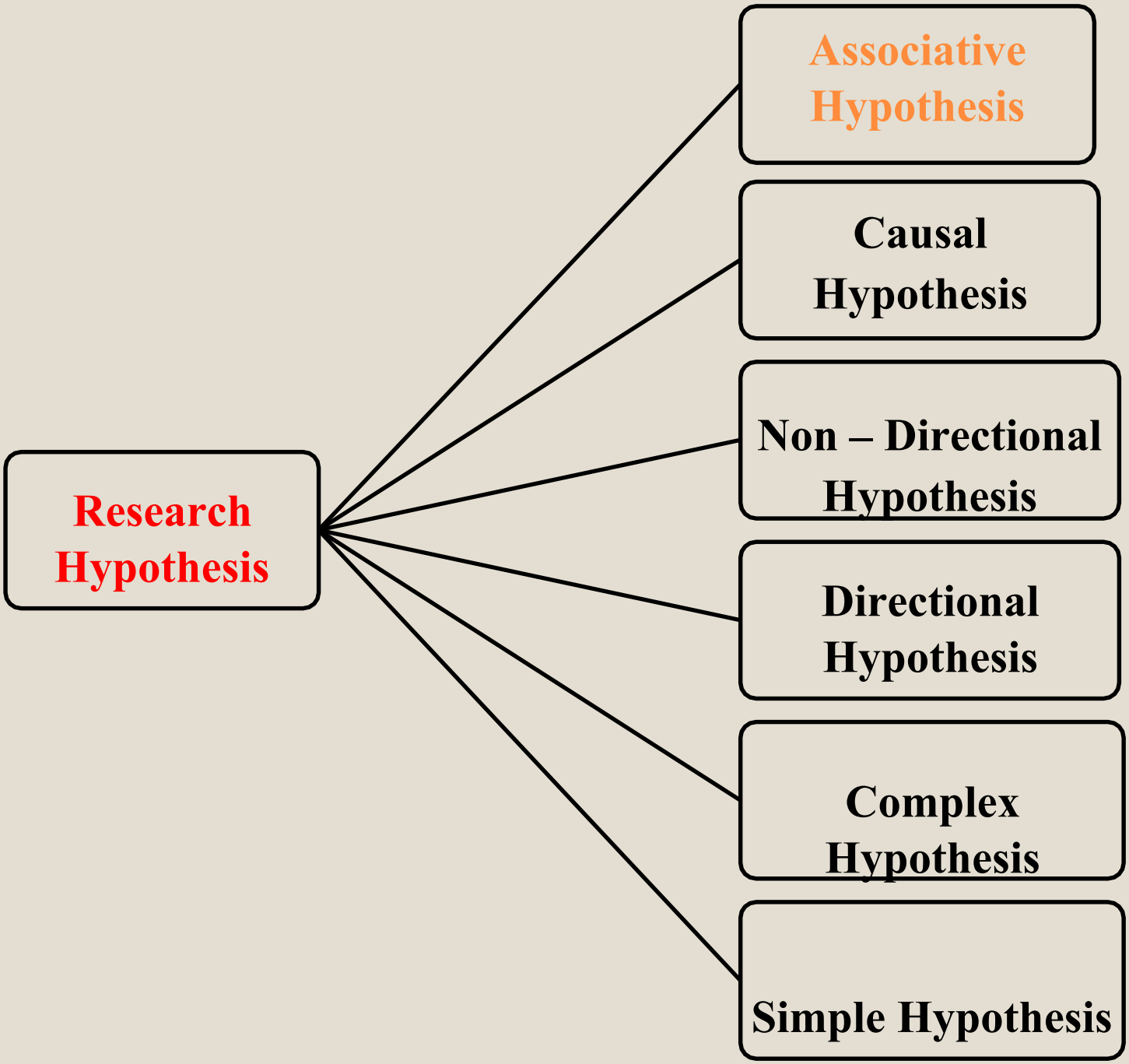
- It provides clarity to the research problem and research objectives
- It describes, explains or predicts the expected results or outcome of the research.
- It indicates the type of research design.
- It directs the research study process.

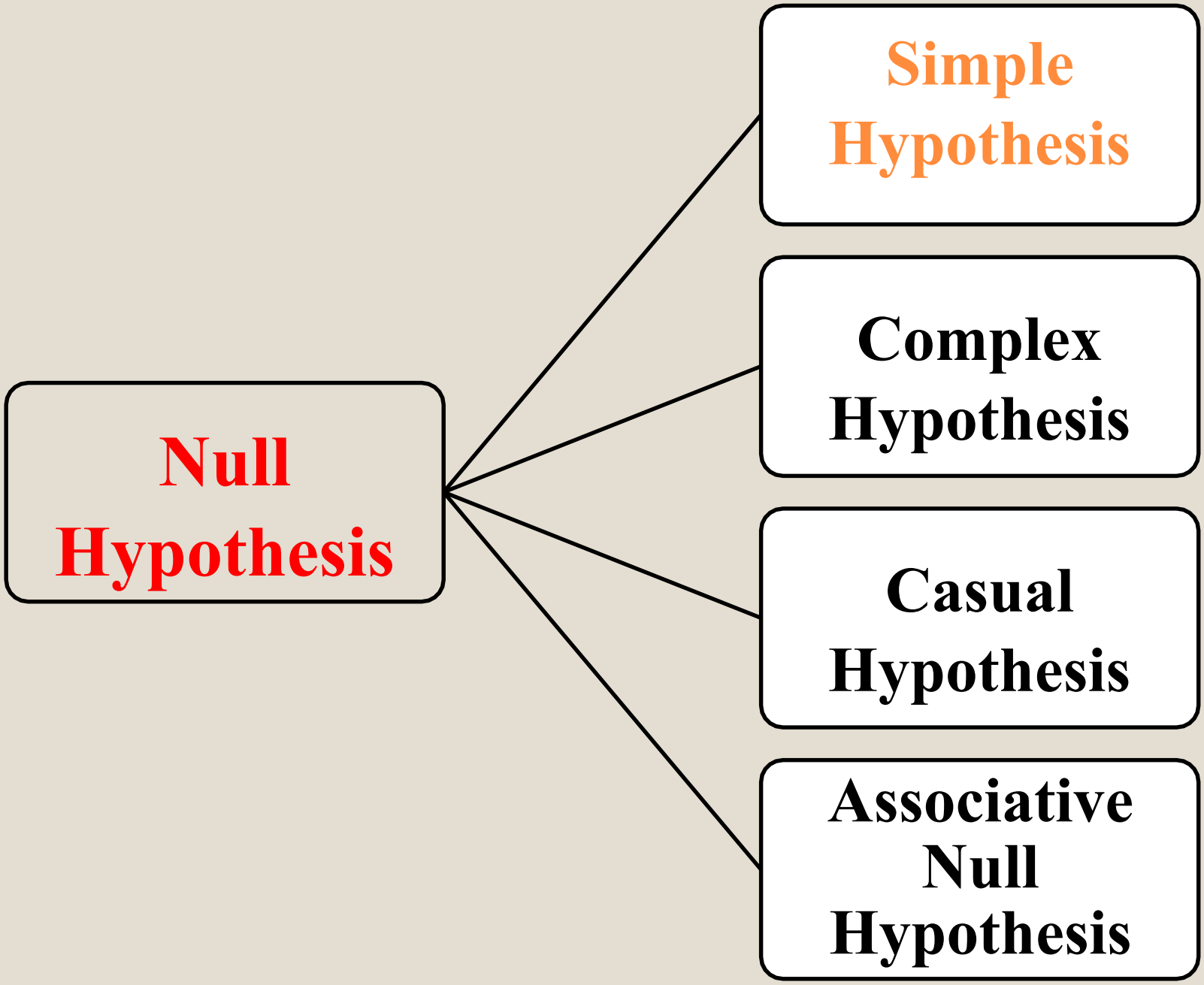
- It identifies the sample of the research study that is to be investigated or examined.

- It facilitates data collection, data analysis and data interpretation

Type of Hypothesis


Hypothesis
Research Hypothesis
Null Hypothesis
Testable Hypothesis


Research Hypothesis
Associative Hypothesis
Causal Hypothesis
Non – Directional Hypothesis
Directional Hypothesis
Complex Hypothesis
Simple Hypothesis


Null Hypothesis
Simple Hypothesis
Complex Hypothesis
Casual Hypothesis
Associative Null Hypothesis

Testable Hypothesis

Research Hypothesis

Simple Hypothesis

- simple hypothesis predicts that, there exist a relationship between the independent variable and dependent variable.

- **Example**- synthesis of a compound under certain condition which can change again & again.

Hypothesis

- complex hypothesis predicts that there exists relationship between two or more independent and dependent variable.

- **Example** – for a fully bed ridden patent 2 hourly position changing, 2 hourly back care and a high protein diet will build up body resistance, will promote blood circulation and will prevent bedsore.
  - In the above example, **three independent variable** are:- A) 2 hourly position changing, B) 2 hourly back care, C) high protein diet.
  - And **three dependent variable** are:- a) promotion of blood circulation, B) building up of body resistance,
    C) prevention of bed sore.

Directional Hypothesis

- Directional Hypothesis predicts the direction of the relationship between the independent and dependent variable.

- **Example-** High quality of nursing education will lead to high quality of nursing practice skills.

Non directionalHypothesis

- **Non -directional Hypothesis** predicts the relationship between the independent variable and the dependent variable but does not specific the **directional of the relationship**.
- **Example**- teacher student relationship influence student's learning.

Causal Hypothesis

- Causal Hypothesis predicts a **cause** and **effects** relationship or interaction between the independent variable and dependent variable. This hypothesis predicts the effect of the independent variable on the dependent variable.

Cont…

- In this the independent variable is the experimental or treatment variable. The dependent variable is the outcome variable

- Example – early postoperative ambulation will lead to prompt recovery.

Associative Hypothesis

- Associative Hypothesis predicts an associative relationship between the independent variable and the dependent variable.
- When there is a change in any one of the variables, changes also occurs in the other variable.

- The associative relationship between the independent and dependent variables may have either.
  - Positive association
  - Negative association

Null hypothesis

- **Null Hypothesis** is also called **statistical hypothesis** because this type of hypothesis is used for statistical testing and statically interpretation. The null hypothesis predicts that, there is no relationship between the independent variable and dependent variable.

- Example- Nasogastric tube feeding does not alter body temperature.

Simplenull hypothesis

- **Example** – bed rest will not relives sever asthmatic dyspnea. In the above example, the independent variable that is, bed rest does not have any causal relationship with the dependent variable that is, severe asthmatic dyspnea.

Complex null Hypothesis

- Example- smoking, drug abuse, alcoholism, tobacco use etc. have no relationship in the occurrence of malaria, mumps or chicken pox.

Causal null Hypothesis

- **Example**- high intake of fluid does not cause tissue oedema. In the above example, the independent variable, that is, high fluid intake does not have any causal relationship with the dependent variable such as, tissue oedema.

Associative null Hypothesis

- Example- Increased does in antibiotics will not reduce body temperature

Testable Hypothesis

- The testable hypothesis predicts relationship between the independent variable and the dependent variable and theses variable are testable or measurable.

- **Example** – Increase in patient's body temperature causes increase in patient's pulse rate.

- **Example**- O_2 administration to a highly nervous patient by a face mask instead of a nasal canula will cause less anxiety to the patient.
  - In this above example, the independent variable that is methods of O_2, administration by face mask cause an effect on the dependent variable, that is patient's state of anxiety. In this the independent variable that is methods of O_2 administration is manipulated. Because
    O_2, instead of face mask, may also be administration by a nasal canula and this may cause an influence on the dependent variable or there may be a different outcome such as, patient's state of anxiety may be increased.

Environmental variable

- **Environmental variable** are the variables which compose a research setting where the research study is conducted. These variables are climate, family background, social background, institution setup, community setup, education setup etc. these variable are also some type of extraneous variable.

- In a **descriptive** or **correlation** research study where the study is conduct in a natural setting and where it is necessary to study the subjects' behavior in a **natural setting**, the researcher makes no attempt to control or alter the environmental variables.

Demographic variables

- **Demographic variable** are the qualities or property or characteristics of the subject under the research study and which are collected to describe sample. These variable are also called the sample characteristics.

- **Example** – subject who are under research study- age, gender, height, weight, build, movement, vision, hearing, speech, religion, marital status etc. are the demographic variables.

Assumption

- **Assumption** are the statement of the basic principal or facts that are established and are universally accepted as true on the basis of logic or reasoning without verification or proof, though they may not have been scientifically tested.

- Assumption is picked up by the research from various sources. These source are previous research studies, theories, clinical fields etc.

Limitation

- **Limitation** are the restrictions within a research study, which reduce the credibility or generalizability of the research findings. The limitations of the research study are also called the weak points of study. It contains one central point & not more than five subpoints.

- It is necessary to recognize the limitations of the research study which might influence the research result.