

RESEARCH METHODOLOGY

LECTURE 6 CONSTRUCTING THE HYPOTHESIS

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HYPOTHESIS

- A hypothesis is an assumption, suspicion, assertion or idea about a phenomenon, relationship or situation, the reality or truth of which you do not know, and you set up your study to find this truth.
- A researcher refers to these assumptions, assertions, statements ideas as hypotheses and they become the basis of an enquiry.
- suppose you have an idea that there are more smokers than non-smokers in your community. To test your idea, you ask either all or just some of the class if they are smokers.
- You can then conclude whether your idea was right or wrong.

- Hence, a hypothesis is an idea, guess, assumption, suspicion, assertion or an idea about a phenomenon, relationship or situation, the reality or truth of which you do not know.

THE FUNCTIONS OF A HYPOTHESIS

- While some researchers believe that to conduct a study requires a hypothesis, having a hypothesis is not essential.
- However, a hypothesis is important in terms of bringing clarity to the research problem.

- Specifically, a hypothesis serves the following functions:
 - The formulation of a hypothesis forces you to precisely specify what you want to find out about, thus bringing specificity and clarity to your study.
 - The specificity and clarity needed to construct a hypothesis ensure you only collect the information you need, thereby providing focus to the study.
 - As it provides a focus, the construction of a hypothesis enhances objectivity in a study.
 - The testing of a hypothesis enables you to specifically conclude what is true or what is false, thus enabling you to contribute towards theory formulation.

TYPES OF HYPOTHESIS

- ❑ Theoretically there should be only one type of hypothesis, that is the research hypothesis - the basis of your investigation.
- ❑ Broadly, there are two categories of hypothesis:
 - ❑ 1. Research hypotheses;
 - ❑ 2. Alternative hypotheses.

ALTERNATIVE HYPOTHESIS

- The formulation of an **alternative hypothesis** is a convention in scientific circles.
- Its main function is to explicitly specify the relationship that will be considered as true in case the research hypothesis proves to be wrong.
- In a way, an alternative hypothesis is the opposite of the research hypothesis.
- Conventionally, a null hypothesis, or hypothesis of no difference, is formulated as an alternative hypothesis.

EXAMPLE

- Suppose you want to study the smoking pattern in a community in relation to gender differentials.
- The following hypotheses could be constructed:
 - 1. There is no significant difference in the proportion of male and female smokers in the study population. (Null Hypothesis)
 - 2. A greater proportion of females than males are smokers in the study population.
 - 3. A total of 60 per cent of females and 30 per cent of males in the study population are smokers.
 - 4. There are twice as many female smokers as male smokers in the study population. (Research Hypothesis)

- ❑ When you construct a hypothesis stipulating that there is no difference between two situations, groups, outcomes, or the prevalence of a condition or phenomenon, this is called a null hypothesis and is usually written as “ H_0 ”.

ERRORS IN TESTING A HYPOTHESIS

- In drawing conclusions about a hypothesis, two types of error can occur:
- Rejection of a null hypothesis when it is true. This is known as a **Type I error**.
- Acceptance of a null hypothesis when it is false. This is known as a **Type II error**.

TYPE I ERROR

- ❑ In testing a hypothesis, for many reasons you may sometimes commit a mistake and draw the wrong conclusion with respect to the validity of your hypothesis.
- ❑ If you reject a null hypothesis when it is true and you should not have rejected it, this is called a Type I error.

TYPE II ERROR

- ❑ In testing a hypothesis, for many reasons you may sometimes commit a mistake and draw the wrong conclusion in terms of the validity of your hypothesis.
- ❑ If you accept a null hypothesis when it is false and you should not have accepted it, this is called a Type II error.

HYPOTHESES IN QUALITATIVE RESEARCH

- As qualitative studies are characterized by an emphasis on describing, understanding and exploring phenomena using categorical and subjective measurement procedures, construction of hypotheses is neither greatly advocated nor significantly practiced.