Constructing Hypotheses

RESEARCH METHODOLOGY

a step-by-step guide for beginners

Topics covered

- Definition of a hypothesis
- Function of hypothesis
- How to formulate a hypothesis
- Types of hypotheses
- Errors in testing hypotheses

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Definition of a hypothesis

- Verification of an assumption/ assertion
- Assertions become the basis of the enquiry and are called hypotheses
- Hypotheses bring focus to the research problem in quantitative research
- Grinnell's definition (1988: 200)
  - A tentative proposition that can be proven or disproven
  - Validity is unknown, hence reliable and valid data needed
  - Specifies a relationship between variables

Functions of a hypothesis

- The formulation of a hypothesis brings specificity and clarity to a study.
- This specificity and clarity used to construct a hypothesis ensures that only information needed is collected, thereby, providing focus to the study. This also enhances the validity of a study as it ensures measuring what the study sets out to measure.
- As it provides a focus, the construction of a hypothesis enhances objectivity in a study.
- The testing of a hypothesis enables the researcher to specifically conclude what is true or what is false, thereby, contributing towards theory formulation.

Figure 6.1 The process of testing a hypothesis

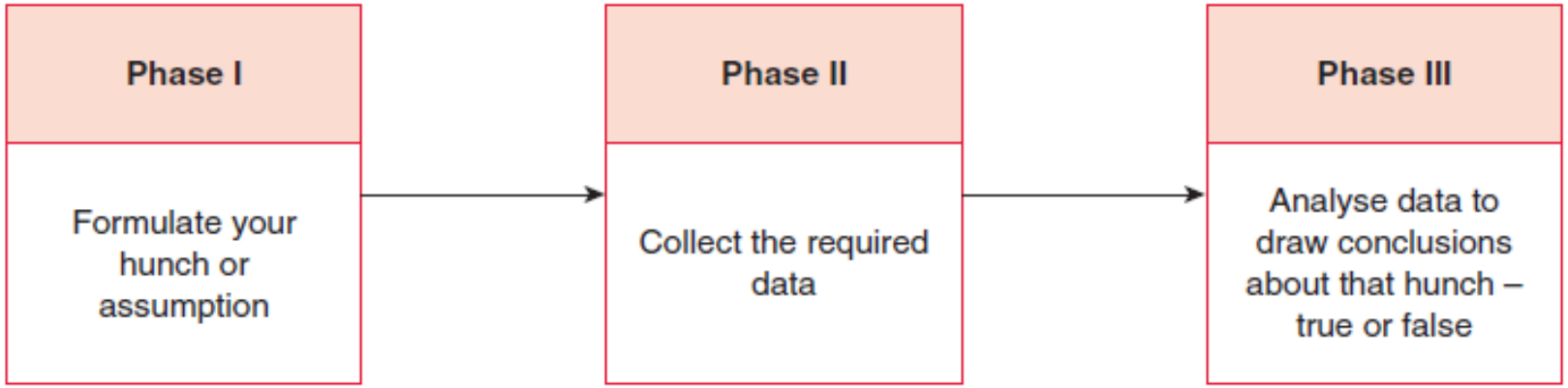

Figure 6.1 The process of testing a hypothesis

How to formulate a hypothesis

- A hypothesis should be simple, specific and conceptually clear
- A hypothesis should be capable of verification
- A hypothesis should be related to the existing body of knowledge
- A hypothesis should be measurable

The average age of male students in this class is higher than that of the female students.

Figure 6.3 Types of hypotheses

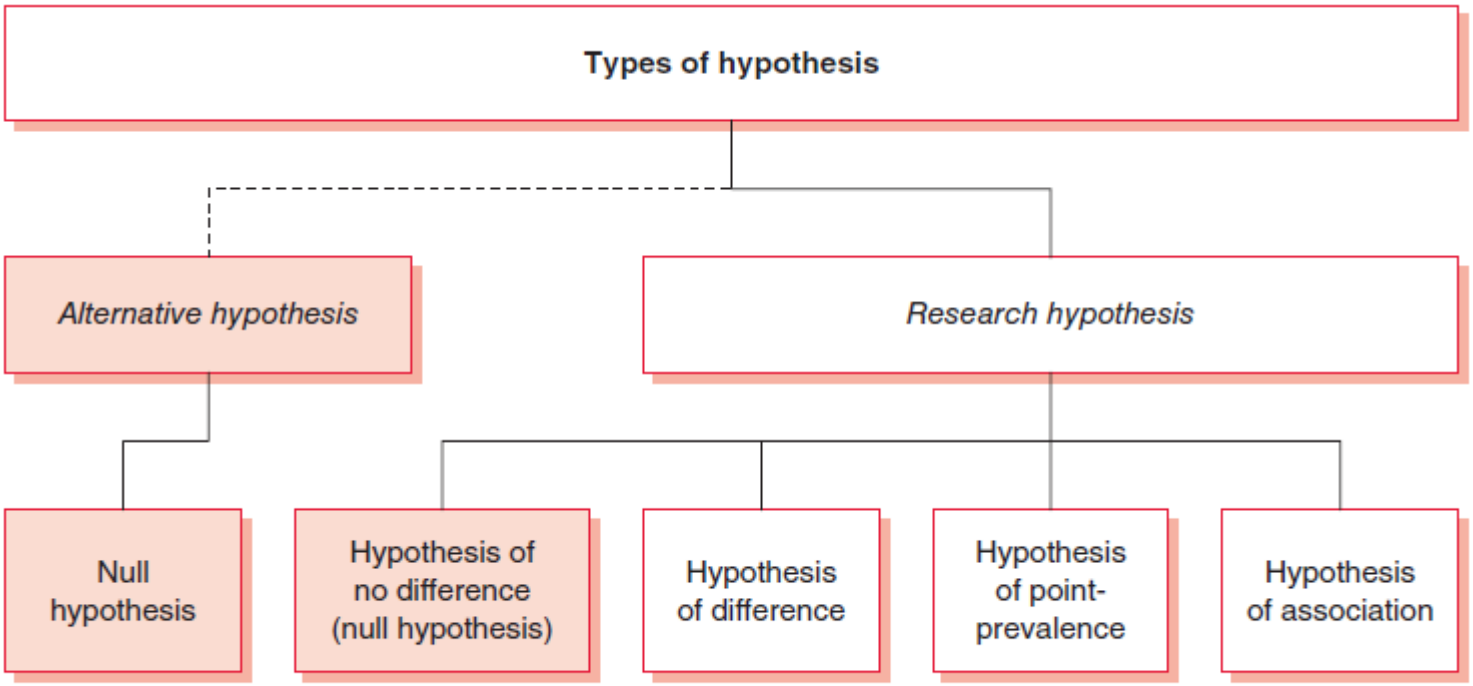

Figure 6.3 Types of hypothesis

Null hypothesis H_0

- The null hypothesis states that there is no difference between two situations, groups, outcomes, or the prevalence of a condition or phenomenon
- H_0: There is no difference in the average age of male and female students in this class
- Hypothesis of difference: There is a difference in the average age of male and female students in this class

Errors in testing hypotheses

Incorrect conclusions about the validity of a hypothesis may be drawn if:

- the study design selected is faulty
- the sampling procedure adopted is faulty
- the method of data collection is inaccurate
- the analysis is wrong
- the statistical procedures applied are inappropriate
- the conclusions drawn are incorrect

Figure 6.4 Type I and Type II errors in testing a hypothesis

When your decision is to:	When a null hypothesis is actually: True	When a null hypothesis is actually: False
Accept	Correct decision	Type II error
Reject	Type I error	Correct decision

Figure 6.4 Type I and Type II errors in testing a hypothesis