



Statistics

Lecture 3

Basics of research Methodology and Statistics

By Dr.Chelli

Lecture objectives:

Identifying:

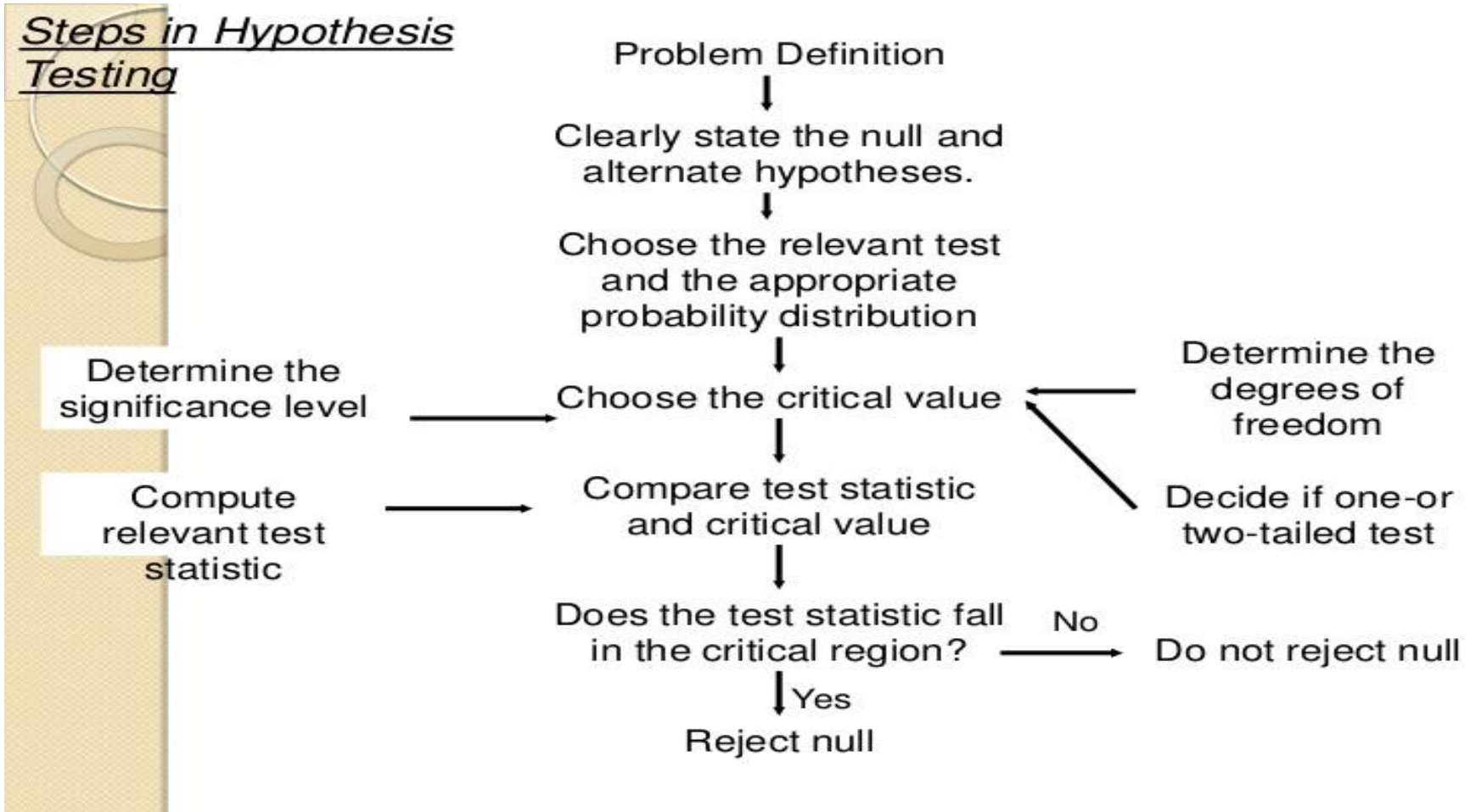
- Major steps in testing a research hypothesis
- Essential characteristics of experiments,
- Surveys/ non experimental research
- observations


Major steps in planning research

- Select a topic
- Read and review the relevant and research literature on the topic
- Decide an important question to research/ sub questions
- Do you have the time and other resources
- Pose the research question as a hypothesis/ if possible make sure that you hypothesis postulates the direction of the relationship.
- What do you think is the most appropriate method (s) for testing your hypothesis- survey, observation, experiment. For experiments, how will you manipulate the causal or independent variable.
 - If possible, use randomization
- How will you measure each of your variables?
- Check with your supervisor if your proposals are ethical
- Run a pilot study with a few cases to ensure that your procedures work
- Run your main study
- Draw up tables and diagrammes to summarize your data
- Carry ou statistical tests of significance to test your hypothesis
- Write up your findings in the form of a report

(adapted from Howitt & Cramer, 2005)

Main steps in hypothesis testing



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- But before dealing with these steps, other basics have to be introduced; in other words, we need to pass through different phases to know how a hypothesis can be tested.
 - Let us first remember together the **common** research methods that can be used in different studies.



Common research methods

Among the research methods one can use in research, the most common, requiring statistics are:

- ❑ Experiments
- ❑ Surveys/ non experiments and
- ❑ observations



1. Experiments


- Experiments are so common in different fields including human sciences.
- They involve intervening in a situation in order to see whether this intervention changes things.

In other words, they explore causal relationship between variables (the effect of the independent variable on the dependent variables).

Essential characteristics of experiments

Experiments have three defining characteristics

- **Manipulation:** a variable is manipulated to assess whether this affects a second variable.
- **Control:** great care is taken to ensure that apart from this manipulation, everything is the same for the research participants in all other possible respects.
- **Random assignment:** participants are selectly randomly to avoid bias (Howitt and Cramer, 2005, p.10).



However, it is not always possible in our situation to undertake an experimental research (random selection of the participants), but rather the use of the quasi-experimental reseach is more common.

Task 1: what is the difference between experimental research and quasi-experimental research.



2. Surveys/Non- experiments

The distinction between the broad types of research: experiments and surveys is one of the most important aspect of research methodology not only in psychology as asserted by Howitt and Cramer, but this also concerns our field.

In some ways, non-experimental studies are the simplest form of research. They might merely involve asking people about their behaviour and/ or that of others.



This kind of research includes:

- Self completion questionnaires
- Interviews

3. Observations

The distinctive feature of observation as a research process is that it offers an investigator the opportunity to gather ‘live’ data from naturally occurring situations (Cohen et al., 2007, p. 397).



Task 2: List the different types of

- Questionnaires
- Interviews
- Observations

Task 3: What is the difference between quantitative and qualitative research?

References

1. Howit, D, Cramer,D. (2005). First steps in research and statistics: A practical workbook fro psychology students. Taylor & Francis Group: Routledge.

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2. Cohen, L, Manion, L & Morison, K. (2007). Research methods in education. New York: Routledge

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