Statistics
Lecture 2 By Dr.Chelli
The basics of research/statistics

Learning objectives
Identifying types of hypotheses
Formulating hypotheses

Introduction

- Any research problem is expressed in terms of research question(s) and/or hypotheses.
- Before starting to undertake any research study, we should ensure first if it is **feasible.**

What is meant by feasibiltiy and what is it related to?

Feasibility of a study

The feasibility of a study may depend on a number of factors:

- Breadth of the study in relation to its research questions' scope and answerability.
- Whether it will be possible to obtain the data necessary to answer the questions.

For example:

What is the effect of the native language on the learning of a second or a foreign language?

This cannot be answered because it is a research area, but not a specific question

How can you narrow or make it specific?

Activity 1: Study these topics and say whether they can be feasible or not.

- 1. The Effects of the Process Approach on Learners' learning
- 2. Attitudes on the Use of Collaborative Learning in Writing
- 3. An Investigation on the Impact of ICT's on learning English
- 4. The Role of Motivation in English Foreign Language Learning in the Algerian School
- 5. The Impact of Formulaic Language on Developing Learners' Conversational Competence

A Case Study of First Year Master Students at Mohammed Kheider University of Biskra

- 5. The Impact of Formulaic Language on Developing Learners' Conversational Competence

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- Investigation of the Contextual and Psychological Factors that Affect Reading Comprehension
- The Case Study of the second year foreign languages learners in M’sila secondary school
- The Importance of Word Analysis on Learners’ Reading Comprehension
- Case Study of First Year LMD Students at M’sila University

Research questions

- One of the most difficult aspects of any research understanding is the identification of appropriate research questions.

What are the features of good research questions?

- Research questions need to be interesting in the sense that they address current issues, at the same time
- They need to be sufficiently narrow and constrained so that they can be answered.

*Broad questions can be difficult if not impossible to be addressed without breaking them down into smaller answerable questions.

- The research ideas need to be current, we should check whether the research questions have not been answered in the literature, or have only partially been answered and require further additional research.

What do you rely on in asking research questions?

Most questions come from a reading of the literature and an understanding of the history of current issues.

We can develop research questions through suggestions made by other researchers. Another way is through extensive reading and analysis of existing research, which can lead to the identification of gaps that may strike a reader as important

On other occasions, ideas for research might stem from observing learners either in or out of a classroom context or through some general feeling or curiosity

Hypotheses

Research problems are generally expressed in terms of research questions and/or hypotheses. Research questions are questions for which answers are sought, whereas hypotheses can be used to express what the researcher expects the results of investigation to be.

Definition

- A hypothesis is a specific testable prediction about what would happen in a study. It provides a tentative explanation for a phenomenon under investigation (Leedy & Ormrond,2001).
- It is a formal statement that presents the expected relationship between an independent and dependent variable (Creswell, 2001)

What are hypotheses based on?

They are based on observation or on what the literature suggests the answers might be.There are times when, because of lack of literature, hypotheses cannot be generated because the research is dealing with something new and/or unexplored (Mackey & Gass, 2005, p. 19).

Forms of hypotheses

They can take different forms depending on the questions being asked and the type of study being conducted.
Some may simply describe how two things are related.
Others may hypothesize that one variable causes change in another one/ or effect on another one.

Paradigmatic differences in formulating hypotheses

According to Dörneiy (2007, p.74), **Qualitative and quantitative studies** differ considerably in terms of how the purpose of the investigation is specified and how it is broken into specific research questions.
In quantitative studies, it is generally true that the more specific the research purpose/ question, the better.

Thus, good quantitative purpose statements often identify the target variables and causal or descriptive relationship between them to be examined.
The research questions, then, specify concrete methodological procedures, and research hypotheses are also drawn up containing the researcher's predictions.

QUAL research purposes and questions are often vaguer than their QUAN counterparts… They tend to be broader than quantitative ones, often focusing on the big picture or the main processes that are shaped to shape the target phenomenon- usually it is not possible to be more specific at this stage without limiting the inquiry and, therefore, investigators emphasize the exploratory nature of the study instead.

Types of hypotheses

Alternative hypothesis: We hypothesize that students make errors in the use of prepositions because of the native language interference.

Null hypothesis: Students do not make errors in the use of prepositions because of the native language interference.

Hypothese are generally declarative statements.
They are typically phrased as if-the statement.
Can you give examples?

The alternative can be **directional or non-directional**.

The directional, also called **one tailed**, predicts that there will be a difference between groups and specifies how the groups will differ.
Example: Boys will perform better than boys in speaking if they are exposed to authentic listening texts. (shows the direction

The non- directional hypothesis, also called **two tailed**) predicts that there will be a difference between groups without specifying the direction of this difference.
Example: There will be a difference in the performance of girls and boys in speaking if they are exposed to authentic listening texts. (not defining what kind of difference)

One-tailed and two-tailed hypotheses

- Will depend on your research question
  - two-tailed hypothesis
    - Does not specify direction
    - Only asks "Is there a significant difference?"
  - one-tailed hypothesis
    - Question specifies a direction
    - "Is the difference significantly greater?"
    - "Is the difference significantly less?" etc.
  - The one-tailed probability is the two-tailed probability from SPSS divided by 2

Task 1:

1. How can we know if a hypothesis is directional or non-directional
2. Reword the following non-directional hypotheses so that they become directional.

-The number of children in a family is related to children's cooperativeness with others.

-Emotional stability is related with satisfaction with close relationships

Reword the following directional hypotheses so that they become directional.

-Boys brought without fathers will be less masculine than boys brought up with fathers.

-Unemployement leads to increased stealing.

Prepare in pairs non- directional hypotheses, then turn them into directional ones.

References

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