Statistics

Lecture 1 By Dr.Chelli

The basics of research/statistics

Learning objectives

Recognizing and identifying types of variables

Definition of variable

In order to carry out any sort of measurement, we need to think about variables; that is, characteristics that vary from one person to person, text to text, or object to object. Simply put, variables are features or qualities that change (Mack & Gass, 2005).

Types of variables

The independent and the dependent variables are the most important ones.

- **1. The independent Variable**

The independent variable is the one we believe may cause the results. It is manipulated to determine its effects on the dependent variable.

- **2. The Dependent Variable**

  The dependent variable is the one we measure to see the effect of the independent variable on it.

Can you give examples of both variables?

Identifyning variables

- **Activity:** identify the type of variables in each of the following research questions and hypotheses.
- Does feedback type affect subsequent performance?
- Is there a relationship between parents education and their children success?

- Does the process approach develop learners' writing strategies?
- Does the use of authentic activities help learners acquire listening competencies?
- We hypothesize that learners' lexical competence will be developed through mobile assisted learning.
- If leaners are trained in the use of signals, their writing productions will improve in terms of accuracy.

The researcher can also take into consideration other types of variables, some of them are presented below:

Extraneous variables

- They are defined as variables other than the independent which may have an effect on the dependent one.

They are important when designing your experiment because they could potentially alter your results leading to misinterpretation and flawed conclusions!

Moderator variable

characteristics of individuals or of treatment variables that may result in an interaction between an independent variable and other variables

is a type of an independent variable that may not be the main focus of the study

may modify the relationship between the independent variable and the dependent variable

For example, when dealing with any research question, gender may affect them.

Intervening variables

intervening variables are similar to moderator variables

but they are not included in original study either because the researcher has not considered the possibility of their effort or because they cannot be identified in a precise way.

Learners' abilities may be due to test-taking abilities rather than the treatment.

Control variables

- When conducting research, one ideally wants to study the effects of the independent variable on a dependent variable.
- For example, consider the impact of feedback type on a performance measure.

- The findings may not be caused by the independent variable.
- What do you think they can be due to?

- the possibility that learners with different levels of proficiency respond differently to different types of feedback.
- Another possibility is the difference of their prior language experiences.

Whenever possible, researchers need to identify these possible factors and control them in some way, although it should be recognized that identifying them in L2 and foreign language learning may be difficult.

You also need to be familiar with other types of variables called

1. Categorical versus continuous variables

Categorical variables are variables that can take on specific values within a degree range of values**.**They can be measured with a greater degree of precision. For example, gender, can be male or female.

In contrast with categorical variables, continuous variables are variables that can take on values along the continuum. For example, age, income, weight and height. Therefore, the type of data produced differs from one category to another.

2. Qualitative versus quantitative variables

• Qualitative variables are those that vary in kind. Rating something as ‘attractive’ or not, ‘helpful’ or not or ‘consistent’ or not are examples of qualitative variables that vary in kind.

• Whereas, reporting the number of times something happened or the number of times someone engages in a particular behaviour are examples **of quantitative variables** because they provide information regarding the amount of something (Marczik, DeMatteo, Festinger, 2005).

Task:

1. Define descrete variables.
2. What should a research do in order to ensure that the results are caused by the treatment (the effect of the independent variable)?

References

Mackey, A & Gass, S.M. (2005). Second language research: Method and design. London Lawrence Erlbaun, Associate Publihers, Mahwah.