Learning Objectives

Upon completion of this unit, students should be able to:

1. Describe the data collection process.
2. Describe how to interpret data and analyze results.
3. Explain the roles of inference and chance in explaining experimental results.
4. Describe the steps that are taken in conducting a test of statistical significance.
5. Create the implications and limitations section of a research proposal.

Written Lecture

In this unit, the topics will focus on data collection and what to do with the data once it has been collected. The last unit introduced the use and creation of tests, which obtain wanted information. Together, these two units will provide the framework for completing an explorative research study.

Data collection involves four steps: (1) creation of data collection form to organize the data once it is collected, (2) the creation of a coding strategy, (3) collection of data, and (4) entry into the data collection form. Remember, it is not the results that you are interested in. It is how the results are interpreted that is important to the study. When you receive your data, it is considered raw data. After the raw data is entered into the collection form, it can be interpreted to extract the result of the study. Coding the data can help in the interpretation of the data. Table 7.2 on page 153 of the textbook shows an example of coding for six data points.

Once you have completed the four steps of data collection, you are ready to interpret your results. The process of analysis of data is also called statistics. Statistics has two main purposes that include: describing the data population and inferring causes. Both of these are covered in this unit.
Descriptive statistics involves tabulations to present quantitative or qualitative data in a concise and revealing format. Statistical tabulations, such as the mean score (arithmetic average), median, mode, standard deviation, and range provide information on sample characteristics. Chapter 7 focuses on the steps in the data collection process along with the “Ten Commandments” to collecting data successfully.

The second use of statistics is for inference; that is, to test relationships among variables of interest and to generalize the findings to a larger population (based on the sample). Drawing conclusions about the relationships among variables and to generalize these conclusions to other situations is at the heart of basic research. For example, if we have pre- and post-test results demonstrating an increase in test scores, we can say that the increase is due to the intervention. Of course, this assumes the group of people taking the tests is a representative sample of a larger population and that we controlled for sampling error. Statistical methods, such as analysis of variance (ANOVA), can determine if the average scores are statistically significant.

Chapter 8 takes you from simply describing sample characteristics (i.e., descriptive statistics) and explains how inferences can be made about the population from which a sample is drawn using techniques known as inferential statistics. Basic concepts, such as the central limit theorem and null hypothesis significance testing, are introduced, as well as how significance testing works. It is also important to know how to select the appropriate test statistic.

In this lesson, we covered the data collection process and the analysis of the data. These topics provide a framework for the research process. Keep in mind for this class; you will not be collecting data for the research proposal. Instead, you will propose hypothetical data for the purpose of this class.

**Learning Activities (Non-Graded)**

Follow the link below to the Pearson Companion Website, and complete the Practice Test and Applications 7.1 and 7.2:

http://wps.ablongman.com/ab_researchmethods_studysite_1/98/25198/6450688_cw/index.html

Follow the link below to the Pearson Companion Website, and complete the Practice Test and Applications 8.1 and 8.2:

http://wps.ablongman.com/ab_researchmethods_studysite_1/98/25198/6450714_cw/index.html

**NOTE:** To access the article referenced in Application 8.1, please click on the following link:

http://cte.udel.edu/sites/udel.edu.cte/files/ntlf/v8n2/pygmalion.htm