# Research Methods: Nonexperimental Approaches and Statistical Analysis

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## Overview {-}

As we begin this unit, it is important to realize what we often don’t think of when we think of research. While controlled experiments in the laboratory often yield important new information and knowledge in psychological research, exploration into human and animal behavior is not limited to this setting. Social scientists, including psychologists, have developed other methods to explore the complexities of human and animal life. These methods, sometimes labeled Nonexperimental Approaches, have gained more and more acceptance as valid ways to gain knowledge and understanding through decades of research and refinement. These approaches include both Applied and Field Research and access various methods to gain data including the use of Quasi-Experiments and Surveys. Issues of validity and the meaning of correlation are explored as we seek to discover true knowledge to contribute to the understanding of people and other animals--what makes them who they are, why they behave the way they do, and how we can help improve their lives.

A very important part of research methods is the enduring relationship it shares with statistics. The two go together like peanut butter and jelly. Why is this so important? Well, in conducting research (whether quantitative or qualitative) we need a way to collect, classify, analyze, and interpret results. This is where statistics comes into play. Statistics essentially helps us turn data into useful information that can benefit society. Together, we will take a crash course in statistics, focusing in on different scales of measurement and when they are used in classifying data.

### Topics {-}

This unit is divided into the following topics:

1. Various Methods of Nonexperimental Research and How it Impacts Validity
2. Statistics and Scales of Measurements in Research Methods

### Learning Outcomes {-}

When you have completed this unit, you should be able to:

* Describe the difference between Experimental and Nonexperimental approaches in psychological research.
* Explain concerns about Validity in nonexperimental research settings.
* Understand the concept of Correlation and what is does and does not mean.
* List various methods of Applied and Field Research.
* Describe different scales of measurement used in research methods
* Understand the difference between inferential and descriptive statistics and why it is used in research methods

### Activity Checklist {-}

Here is a checklist of learning activities that will help you deepen your understanding of the unit concepts. Activities are meant to be formative (unless otherwise specified), as in an ungraded opportunity for you to develop your thinking; however, many of these are designed to also help you with your summative assessments.

**Learning Activities**

**Activity 4.1: Read and Take Note**

* **Read Chapter 7 of the textbook and follow the prompts for note-taking to learn about nonexperimental research**

**Activity 4.2: Read, Watch and Reflect**

* **Read Chapter 8 and watch a video to learn about statistics**

**Activity 4.3: Key Terms Quiz (ungraded)**

* **Complete the matching quiz to review key concepts.**

**Assessment**

* Submit Assignment 1: Interview a Professional
* Continue working on Assignment 4: Literature Review and Hypothesis (due Week 5)

### Resources {-}

Here are the resources you will need to complete this unit.

* Dunn, Dana S. (2013). The Practical Researcher: A Student Guide to Conducting Psychological Research. 3rd ed., John Wiley & Sons, Inc.
* Other resources will be provided online

## Various Methods of Nonexperimental Research and how it Impacts Validity

**Human beings and other animals are complex and wonderful creatures. The understanding of people and animals cannot be limited to what we can discover in the laboratory. It is necessary to go out and observe and measure behavior in true life settings. Sometimes this will involve setting up quasi-experiments or taking surveys of how people feel about various aspects of their lives. While these research methods yield rich information about people and other animals, how to interpret the data we gather can be fraught with difficulties of validity, the meaning of correlation between variables, and the possibility of multiple variables we have not even considered or measured. Both qualitative and quantitative tools of analysis help us to decipher and tease apart the complexities and meanings of the variables we are studying. Using correlation we can explore how two variables change together. They may not be in a cause and effect relationship. For example, researchers have found that people who attend church more times in a week live on average up to 5 or more years longer. So the question is: What is it about going to church that helps people live longer? Is it their trust in God that leads to less stress and therefore longer life, or perhaps the support from the community of believers or is it something else? How do these variables relate to one another? Nonexperimental research methods can be used to help find these answers.**

**As we gather the data and utilize these tools of analysis, it helps us to build on the understanding of human beings and other animals.**

Learning Activities

Activities are meant to be formative (unless otherwise specified), as in an ungraded opportunity for you to develop your thinking; however, many of these are designed to also help you with your summative assessment so completing them is essential.

### Activity: Read and Take Note {-}

Read Chapter 7 of our textbook.

Take notes on the following:

1. Describe the issues with validity in nonexperimental research
2. List, describe and give an example of the various nonexperimental methods covered in this chapter

## Statistics and scales of measurements in Research Methods

Statistics helps us turn data into useful information. In statistics we have two main categories: descriptive and inferential statistics. Descriptive statistics is organizing and summarizing data using numbers and graphs in a visually appealing manner. For example, in descriptive statistics you can present the data using a bar graph, pie chart, or even a bell curve.

However, the data can also be presented in numbers as well. How so? Well, under the umbrella of descriptive statistics, we also have what is called “Measures of Central Tendency,” - otherwise known as mean, median, and mode. Likewise, we have “Measures of Variability” or what is commonly understood as range, variance, and standard deviation. These, too, can be used to present data. In descriptive statistics, you have the option of presenting your data in numbers (Measures of Central Tendency and Measures of Variability) or in visually appealing and helpful charts.

In Inferential statistics, you use sample data to make an inference and draw a conclusion about the population. The use of probability can also be used in inferential statistics to prove how confident we are in our conclusions and if they are correct. The use of probability in inferential statistics is known as confidence intervals and margins of error.

“In practice, the field of psychology uses nominal, ordinal, interval, and ratio scales in research projects” (Dunn, 2013, p.252).

These are the four main types of measurement, each useful in data presentation. If we were to rank how meaningful each scale of measurement is, nominal scales offer no more than a label, whereas ratio scales offer the most in terms of measurement.

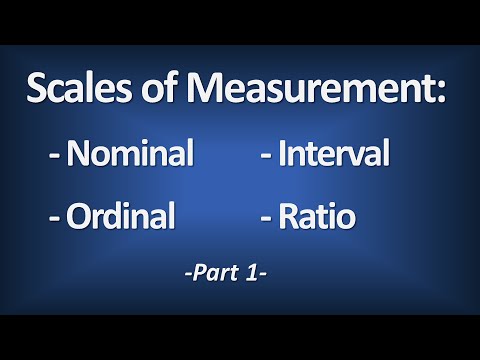
Learning Activities

### Activity: Read, Watch and Reflect {-}

Read Chapter 8 of our textbook. You may want to create a vocabulary table to help you get acquainted with all the terms.

Next, watch the following video, which is helpful in understanding the different scales of measurement:

<https://youtu.be/KIBZUk39ncI>

[](https://youtu.be/KIBZUk39ncI)

**Questions to consider:** After completing the activities above, consider the following questions:

1. What are descriptive and inferential statistics? How do they differ from one another? How are they used in psychological research?
2. What are the four types of scales of measurement used in psychological research? Describe each one in the context of an example.

The take home message with statistics in this course is that you do not need to be intimidated by the numbers, but you need to gain a general understanding of how statistics are used in research.

### Activity: Key Terms Matching Quiz (ungraded) {-}

In order to review some of the major concepts from Chapter 8, take the following unmarked quiz. Although you will not be evaluated on these terms, they will assist you in understanding the relevance of statistics in this this course.

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## Unit Summary {-}

In this unit, you have been able to discover that psychological research is not limited to the laboratory, but also includes Field and Applied Research Methods. These various methods allow us to study the aspects of human and animal behavior in their natural settings and greatly broaden the possibilities for the research questions we wish to explore. Statistical and other methods of analysis then help us to decipher our findings and draw meaningful conclusions to add to the knowledge and understanding of people and other animals.

## Assessment {-}

After completing this unit, including the learning activities, you are asked to complete the following assessments. For more details and the submission boxes, please go to the Assessments tab.

Assignment 1: Interview A Professional

Do not forget to complete both parts of this assignment and submit this week. Please take a look in the submission box for more details.

Assignment 4: Research Project

Next week you need to submit Part 2: Literature Review and Part 3: Hypothesis Statement. You will find more information for each of these part in their respective submission boxes.

## Checking your Learning {-}

Before you move on to the next unit, you may want to check to make sure that you are able to:

* Describe the difference between experimental and non-experimental approaches in psychological research.
* Explain concerns about validity in non-experimental research settings.
* Understand the concept of correlation and what is does and does not mean.
* List various methods of applied and field Research.
* Describe different scales of measurement used in research methods
* Understand the difference between inferential and descriptive statistics and why it is used in research methods