F Distribution and One-Way ANOVA: Introduction[*]

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Abstract

This module provides a brief introduction on handling hypothesis tests with two means by the one-way Analysis of Variance (One-Way ANOVA), F Distribution, and the Test of Two Variances statistical analysis.

1 Student Learning Outcomes

By the end of this chapter, the student should be able to:

- Interpret the F probability distribution as the number of groups and the sample size change.
- Discuss two uses for the F distribution: One-Way ANOVA and the test of two variances.
- Conduct and interpret One-Way ANOVA.
- Conduct and interpret hypothesis tests of two variances.

2 Introduction

Many statistical applications in psychology, social science, business administration, and the natural sciences involve several groups. For example, an environmentalist is interested in knowing if the average amount of pollution varies in several bodies of water. A sociologist is interested in knowing if the amount of income a person earns varies according to his or her upbringing. A consumer looking for a new car might compare the average gas mileage of several models.

For hypothesis tests involving more than two averages, statisticians have developed a method called Analysis of Variance" (abbreviated ANOVA). In this chapter, you will study the simplest form of ANOVA called single factor or One-Way ANOVA. You will also study the F distribution, used for One-Way ANOVA, and the test of two variances. This is just a very brief overview of One-Way ANOVA. You will study this topic in much greater detail in future statistics courses.

- One-Way ANOVA, as it is presented here, relies heavily on a calculator or computer.
- For further information about One-Way ANOVA, use the online link ANOVA[1] . Use the back button to return here. (The url is http://en.wikipedia.org/wiki/Analysis_of_variance.)

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