

## 13.1: Prelude to F Distribution and One-Way ANOVA

### CHAPTER OBJECTIVES

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

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.



Figure 13.1.1: One-way ANOVA is used to measure information from several groups.

For hypothesis tests comparing averages between more than two groups, 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.

### Contributors and Attributions

Barbara Illowsky and Susan Dean (De Anza College) with many other contributing authors. Content produced by OpenStax College is licensed under a Creative Commons Attribution License 4.0 license. Download for free at <http://cnx.org/contents/30189442-699...b91b9de@18.114>.

This page titled [13.1: Prelude to F Distribution and One-Way ANOVA](#) is shared under a [CC BY 4.0](#) license and was authored, remixed, and/or curated by [OpenStax](#) via [source content](#) that was edited to the style and standards of the LibreTexts platform.

- [13.1: Prelude to F Distribution and One-Way ANOVA](#) by [OpenStax](#) is licensed [CC BY 4.0](#). Original source: <https://openstax.org/details/books/introductory-statistics>.