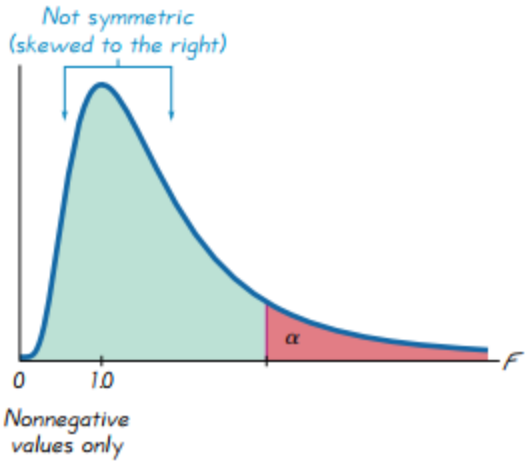

Figure 12-1 *F* Distribution

There is a different *F* distribution for each different pair of degrees of freedom for numerator and denominator.

12-2 One-Way ANOVA

Key Concept In this section we introduce the method of *one-way analysis of variance,* which is used for tests of hypotheses that three or more populations have means that are all equal, as in H_0: $\mu_1 = \mu_2 = \mu_3$. Because the calculations are very complicated, we emphasize the interpretation of results obtained by using technology. Here is a recommended study strategy for this section.

1. Understand that a small *P*-value (such as 0.05 or less) leads to rejection of the null hypothesis of equal means. ("If the *P* is low, the null must go.") With a large *P*-value (such as greater than 0.05), fail to reject the null hypothesis of equal means.
2. Develop an understanding of the underlying rationale by studying the examples in this section.

Part 1: Basics of One-Way Analysis of Variance

When testing for equality of three or more population means, use the method of one-way analysis of variance.

DEFINITION **One-way analysis of variance (ANOVA)** is a method of testing the equality of three or more population means by analyzing sample variances. One-way analysis of variance is used with data categorized with *one* **factor** (or **treatment**), so there is one characteristic used to separate the sample data into the different categories.

The term *treatment* is used because early applications of analysis of variance involved agricultural experiments in which different plots of farmland were treated with different fertilizers, seed types, insecticides, and so on. Table 12-1 uses the one "treatment" (or factor) of blood lead level. That factor has three different categories: low, medium, and high blood lead levels (as defined in Data Set 5 from Appendix B).