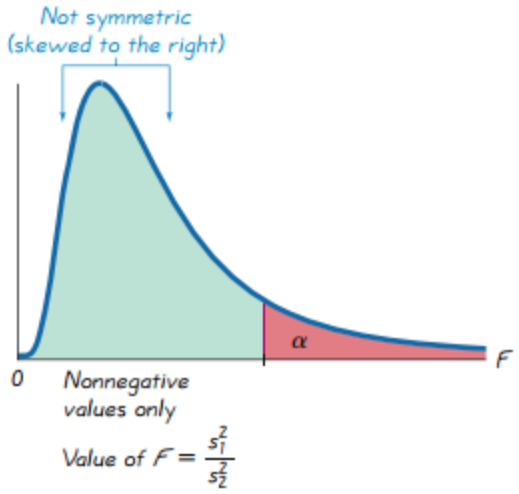

Figure 9-5 *F* Distribution

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

Interpreting the *F* Test Statistic

If the two populations really do have equal variances, then the ratio s_1^2/s_2^2 tends to be close to 1 because s_1^2 and s_2^2 tend to be close in value. But if the two populations have radically different variances, s_1^2 and s_2^2 tend to be very different numbers. Because we are stipulating that s_1^2 is the larger sample variance, the ratio s_1^2/s_2^2 will be a large number whenever s_1^2 and s_2^2 are far apart in value. Consequently, a value of F near 1 will be evidence suggesting that $\sigma_1^2 = \sigma_2^2$, but a large value of F will be evidence against the conclusion of equality of the population variances.

***Large* values of *F* are evidence against $\sigma_1^2 = \sigma_2^2$.**

Example 1 Accurate Red and Creative Blue

In the Chapter Problem, we noted that researchers from the University of British Columbia conducted trials to investigate the effects of color on creativity. Subjects with a red background were asked to think of creative uses for a brick, while other subjects were given the same task with a blue background. Responses were scored by a panel of judges and results from scores of creativity are given below. In Example 2 of Section 9-3 we tested the researchers' claim that "blue enhances performance on a creative task," and we found that there is sufficient evidence to support the claim that subjects with a blue background get higher scores than those with a red background. That hypothesis test involved two independent population means. Let's use the same data to test the claim that those tested with a red background have creativity scores with a standard deviation equal to the standard deviation for those tested with a blue background. Use a 0.05 significance level.

Creativity Scores	
Red Background:	$n = 35, \bar{x} = 3.39, s = 0.97$
Blue Background:	$n = 36, \bar{x} = 3.97, s = 0.63$