

20. Levene-Brown-Forsythe Test for Comparing Variation in Two Populations Use the weights (g) of pre-1964 quarters and post-1964 quarters listed in Data Set 21 of Appendix B. Use the Levene-Brown-Forsythe test with a 0.05 significance level to test the claim that weights of pre-1964 quarters and weights of post-1964 quarters are from populations with the same standard deviation.

21. Finding Lower Critical F Values For hypothesis tests that were two-tailed, the methods of Part 1 require that we need to find only the upper critical value. Let's denote that value by F_R , where the subscript indicates the critical value for the right tail. The lower critical value F_L (for the left tail) can be found as follows: First interchange the degrees of freedom used for finding F_R , then take the reciprocal of the F value found in Table A-5. Using a significance level of 0.05, find the critical values F_L and F_R for a two-tailed hypothesis test with sample sizes of $n_1 = 10$ and $n_2 = 21$.

Chapter 9 Review

In this chapter we considered methods for using two samples for making inferences about two populations. Specifically, we presented methods for testing claims or constructing confidence interval estimates based on the following:

- Section 9-2: Proportions from two samples selected from two populations
- Section 9-3: Means from samples selected from two independent populations
- Section 9-4: Mean of the differences from two dependent samples consisting of matched pairs
- Section 9-5: Standard deviations (or variances) from samples selected from two independent populations

Two main activities of inferential statistics are (1) constructing confidence interval estimates of population parameters (as in Chapter 7), and (2) using methods of hypothesis testing to test claims about population parameters (as in Chapter 8). Chapters 7 and 8 considered only cases involving a single population, but in this chapter we considered two samples drawn from two populations.

When using the methods of this chapter, it is important to check the given requirements, including the requirement that the sample data have been collected in an appropriate way. Using data collected with methods that are not appropriate, such as voluntary response samples, could easily provide results that are dramatically wrong.

Chapter Quick Quiz

In Exercises 1–4, use the following survey results: Randomly selected subjects were asked if they agreed with the statement “It is morally wrong for married people to have an affair.” Among the 386 women surveyed, 347 agreed with the statement. Among the 359 men surveyed, 305 agreed with the statement (based on data from a Pew Research poll).

1. Identify the null and alternative hypotheses resulting from the claim that the proportion of women who agree with the given statement is equal to the proportion of men who agree.
2. Find the value of the pooled proportion \bar{p} obtained when testing the claim given in Exercise 1.
3. When testing the claim that $p_1 = p_2$, a test statistic of $z = 2.04$ is obtained. Find the P -value obtained from this test statistic.
4. When using the given sample data to construct a 95% confidence interval estimate of the difference between the two population proportions, the result of (0.00172, 0.0970) is obtained from technology. Express that confidence interval in a format that uses the symbol $<$.