Figure 139. The One-Sample T Test dialog box.

<table>
<thead>
<tr>
<th>One-Sample Statistics</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean</td>
<td>Std. Deviation</td>
</tr>
<tr>
<td>KUDI Depression Scale</td>
<td>30</td>
<td>54.63</td>
<td>10.327</td>
</tr>
</tbody>
</table>

Figure 140. The results of the one-sample t test.

To determine whether the test was significant, examine the table labeled One-Sample Test. The test is significant, t(29) = 2.46, p = .02. The p value is located in the column labeled Sig. Because the p value is less than .05, we reject the null hypothesis that the population mean is equal to 50 at the .05 level.

Using SPSS Graphs to Display the Results

Although graphs are sometimes not included in the Results section of a manuscript because of space limitations, graphs should be presented when possible since they convey a rich understanding of the data. Two graphs that can display the data for a one-sample t test are the histogram and the stem-and-leaf plot. Lesson 21 presents steps for creating both types of graphs. Figure 141 is a histogram showing the distribution of KUDI scores for the 30 cases.

An APA Results Section

A one-sample t test was conducted on the KUDI scores to evaluate whether their mean was significantly different from 50, the accepted mean for male adolescents in general. The sample mean of 54.63 (SD = 10.33) was significantly different from 50, t(29) = 2.46, p = .02. The 95% confidence interval for the KUDI mean ranged from 50.78 to 58.49. The effect size d of .45 indicates a medium effect. Figure 141 shows the distribution of KUDI scores. The results support the conclusion that young male adolescents who do not engage in sports outside of school are somewhat more depressed than average.
**Figure 141.** Distribution of KUDI scores for adolescent boys who do not participate in sports.

**Writing an APA Results Section**

Here are guidelines for writing Results sections for statistical methods that require no follow-up procedures, such as the one-sample t test, correlations, the Mann-Whitney U test, or the binomial test.

1. Describe the test, the variables, and the purpose of the test. For example, "A one-sample t test was conducted on the KUDI scores to evaluate whether their mean was significantly different from 50, the accepted mean for male adolescents in general."

2. Report the results of the statistical test. For example, "With alpha set at .05, the one-sample t test was significantly different from 50, t(29) = 2.46, p = .02. The effect size d of .45 indicates a medium effect."

   - Discuss the assumptions of a test if necessary to describe why it was chosen or, more generally, why the test was valid. It is unnecessary to present routinely the assumptions of tests.
   - As a rule of thumb, report statistics to two or three decimal places.
   - State the alpha level chosen for a statistical test and whether the test is significant or not. The alpha level might be specified for individual tests when reported. Alternatively, the alpha level for all presented statistical tests might be stated in the Methods section or at the beginning of the Results section.
   - Report the test value, degrees of freedom, and significance level. When SPSS reports a p value of .000, we should indicate in the Results section that "p < .01" or "p < .001."
   - Report a confidence interval when possible. A statistical test allows us to make a decision about whether we can or cannot reject a null hypothesis, while a confidence interval allows us to reach the same statistical decision, but also provides an interval estimate of the statistic of interest (e.g., mean, mean difference, or correlation). Confidence intervals should be presented in brackets, unless the range of intervals is described in the working of the test. For example, "The 95% confidence interval for the KUDI mean ranged from 50.78 to 58.49, and therefore the hypothesis that the population KUDI mean is 50 was rejected at the .05 alpha level. Alternatively, "The 95% confidence interval [50.78, 58.49] indicated the hypothesis that the population KUDI mean is 50 was rejected at the .05 alpha level."
   - Report a statistic that allows the reader to make a judgment about the magnitude of the effect, such as a d statistic for a one-sample t test.
3. Report relevant descriptive statistics, such as the mean and the standard deviation for a one-sample $t$ test.
   - For a simple analysis, the descriptive statistics can be reported in the text as $M = 54.63, SD = 10.33$.
   - Statistical notation consisting of Greek letters and abbreviations that are not variables, as well as subscripts and superscripts that are not variables, should be in standard type. Vectors and matrices should be in boldface. All other statistical symbols should be in italics.
4. Summarize the specific conclusions that can be reached on the basis of the analyses, but save interpretation and elaboration on these conclusions for a Discussion section. For example, "The results support the conclusion that male adolescents who do not engage in sports outside of school are somewhat more depressed than the average male adolescent."

Exercises

The data for Exercises 1 through 4 are in the data set named Lesson 22 Exercise File 1 on the Web at http://www.pearsonhighered.com/greensalkindSPSS. The data are from the following research problem.

John is interested in determining if a new teaching method, the Involvement Technique, is effective in teaching algebra to first graders. John randomly samples six first graders from all first graders within the Lawrence City School System and individually teaches them algebra with the new method. Next, the pupils complete an eight-item algebra test. Each item describes a problem and presents four possible answers to the problem. The scores on each item are 1 or 0 where 1 indicates a correct response, and 0 indicates a wrong response. The SPSS data file contains six cases, each with eight item scores for the algebra test.

1. Compute total scores for the algebra test from the item scores. A one-sample $t$ test will be computed on the total scores.
2. What is the test value for this problem?
3. Conduct a one-sample $t$ test on the total scores. On the output, identify the following:
   a. Mean algebra score
   b. $t$ test value
   c. $p$ value
4. Given the results of the children's performance on the test, what should John conclude? Write a Results section based on your analyses.

The data for Exercises 5 and 6 are in the data set named Lesson 22 Exercise File 2 on the Web at http://www.pearsonhighered.com/greensalkindSPSS. The data are from the following research problem.

As part of a larger study, Dana collected data from 20 college students on their emotional responses to classical music. Students listened to two 30-second segments from "The Collection from the Best of Classical Music." After listening to a segment, students rated it on a scale from 1 to 10, with 1 indicating "Makes me very sad" and 10 indicating "Makes me very happy." Dana computes a total score (hap_sad) for each student by summing the student's two ratings. Dana conducts a one-sample $t$ test to evaluate whether classical music makes students sad or happy.

5. Conduct the analyses on these data, and write a Results section for it.
6. If you have not presented a graph in your Results section, create a histogram for the hap_sad scores. Label the graph following APA guidelines.