1-Sample t-tests in SPSS

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Note: SPSS always uses t-scores for one-sample tests of means, never z-scores.

1. Start SPSS and enter your data or open your data file. Make any necessary adjustments in the Variable View. Pay particular attention to the Measurement level(s) of your variable(s). After all, if the data aren’t scale, you shouldn’t be using them in a t-test.

2. In the Analyze menu, click Compare Means. A submenu will appear.

3. In the submenu, click One-Sample T Test... The One-Sample T Test dialog will appear.

4. Put the name of your variable in the Test Variable(s) box.

5. SPSS will give you a confidence interval for the mean of the differences, whether you want one or not. The default confidence level is 95%. If you’d like some other confidence level, then . . .
   • Click Options. The One-Sample T Test: Options dialog will appear.
   • You will see an entry for Confidence Interval Percentage and a box with a number in it, followed by a percent sign. The number in the box is the confidence level for your confidence interval. The default value is 95, for 95% confidence. If you want a different confidence level, type it in the box, as a percentage (not as a decimal number).
   • Click Continue. SPSS will return you to the One-Sample T Test dialog.

6. IMPORTANT: Enter the hypothesized value of your population mean in the Test Value box.1 If you don’t do this, SPSS will assume you want to test $H_0: \mu_x = 0$.

7. Click OK. The result of the hypothesis test will appear in the the PASW Statistics Viewer output window, as follows:
   • First, there is a One-Sample Statistics table. It tells you:
     – $N$, which is the number of valid data SPSS used in its calculations. It’s supposed to be equal to $n$, the number of data in your data set. **Always check this number, to ensure all your data were used.**
     – Mean, which is the mean (that is, $\bar{x}$) of your sample.
     – Std. Deviation, which is the standard deviation (i.e., $s_x$) of your sample.
     – Std. Error Mean, the “standard error of the mean,” which is an estimate of the standard deviation of all sample means of all samples of the same size as your sample. (It’s the same number as $s_x/\sqrt{n}$.)
   • Next is the One-Sample T Test table. It gives you:
     – Test Value = the number you put in the Test Value box of the One-Sample T Test dialog. (The default value is 0.) **Always check this number, to make sure you tested the correct null hypothesis.**

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1This is the value given in your null hypothesis. For example, if your null hypothesis is $H_0: \mu_x = 32$, enter the number 32 in the Test Value box.
- \( t \), which is the \( t \)-score (or, test statistic) of your one-sample \( t \)-test.
- \( df \), the number of degrees of freedom for your \( t \)-test. (Recall that \( df = n - 1 \) for this test.)
- \( \text{Sig. (2-tailed)} \), which is the \( P \)-value of the two-tailed version of your hypothesis test. So, if your alternative hypothesis was \( H_a: \mu_x \neq \mu_0 \), this is the \( P \)-value you need. \textbf{If you have a one-tailed test} (that is, if your alternative hypothesis is \( H_a: \mu_x < \mu_0 \) or \( H_a: \mu_x > \mu_0 \)), you’ll need to divide \( \text{Sig. (2-tailed)} \) by 2.
- \( \text{Mean Difference} \). This is the difference between the sample mean and the hypothesized value of the population mean. It’s calculated as \( \overline{x} - \mu_0 \).
- \( \text{Lower} \) and \( \text{Upper} \), which are the lower and upper bounds of a confidence interval. It is not a confidence interval for the mean, but for the \textit{difference} between the true mean (i.e., \( \mu_x \)) and your \textit{hypothesized} mean (which is \( \mu_0 \), which is the number in your null hypothesis). If you want a confidence interval for the mean, I suggest using the Explore tool. Actually, you should have used Explore before doing the 1-sample \( t \)-test, so you should have a confidence interval for the mean in your SPSS output already.

As always, if you have questions, please ask them!