

Answers to Application Activities for One-Way T-Tests in SPSS

1 Torres (2004)

Use the SPSS file called Torres.sav.

Choose ANALYZE > COMPARE MEANS > ONE SAMPLE T TEST. Choose the READING and LISTENING variables and move them to the “Test Variable” box. Below that box, change the test value from 0 to 3. Open the BOOTSTRAP button and check the “Perform bootstrapping” box. Change the number of samples to 10,000 and the confidence intervals to “BCa”. Press CONTINUE. Press OK.

The output is shown in the table.

	Sample size	mean (s.d.)	95% CI of the difference (between neutral value of 3 and scores on the questionnaire)	95% BCa bootstrapped CI of the difference	Effect size (Cohen's d)
Reading	102	3.2 (1.16)	-0.03, 0.42 (which equals a mean that will fall between 2.97, 3.42)	-0.01, 0.40 (which equals a mean that will fall between 2.99, 3.40)	$(3.2-3.0)/1.16=.17$
Listening	102	3.29 (1.03)	0.09, 0.50 (which equals a mean that will fall between 3.09, 3.40)	0.10, 0.48 (which equals a mean that will fall between 3.10, 3.48)	$(3.29-3.0)/1.03=.28$

For both variables the effect sizes are very small. For Reading the confidence interval runs through zero and is very close to 3, and the tiny effect size confirms that for Reading, there is no important preference for a native speaker. For listening, the confidence interval does not run through zero, but its lower limit is quite close to zero and the very small effect size shows too that there is not a very strong preference for native speakers in teaching Listening either.

2 Torres (2004)

Continue to use the SPSS file called Torres.sav.

Repeat the steps in Exercise #1 but now choose the variables of CULTURE and PRONUNCIATION (this variable starts out with Prefer NS for . . .). If you open up the dialogue box and press the “Reset” button, you won’t have to move the previous variables out of the “Test Variable(s)” box. On the other hand, if you move the variables out and put the new variables in, you won’t need to redo the options with the “Bootstrap” button.

The output is shown in the table.

	Sample size	mean (s.d.)	95% CI of the difference (between neutral value of 3 and scores on the questionnaire)	95% BCa bootstrapped CI of the difference	Effect size (Cohen’s d)
Culture	102	3.52 (.77)	0.37, 0.67 (which equals a mean that will fall between 3.37, 3.67)	0.37, 0.67 (which equals a mean that will fall between 3.37, 3.67)	$(3.5-3.0)/.77=.65$
Pronunciation	102	4.31 (.90)	1.14, 1.49 (which equals a mean that will fall between 4.14, 4.49)	1.15, 1.47 (which equals a mean that will fall between 4.15, 4.47)	$(4.31-3.0)/.90=1.46$

First of all, there are essentially no differences between the parametric and bootstrapped CIs. For both variables the effect sizes are larger than we saw in the previous variables. For Pronunciation, especially, at almost 1.5 standard deviations of difference from the neutral value of 3, the mean value has quite a large effect size and shows that most students in this survey higher prefer to have native speakers when it comes to teaching pronunciation. The confidence intervals reflect this fact as well, with a confidence interval for Pronunciation which runs very far away from the neutral value of 3.

3 Dewaele and Pavlenko (2001–2003)

Use the BEQ.sav file.

Choose ANALYZE > COMPARE MEANS > ONE SAMPLE T TEST. Choose all four variables and move them to the “Test Variable” box. Change the test value from 0 to 5. Open the BOOTSTRAP button and check the “Perform bootstrapping” box. Change the number of samples to 10,000 and the confidence intervals to “BCa”. Press CONTINUE. Press OK.

The output is shown in the table.

Area	Sample size	mean (s.d.)	95% CI of the difference (between neutral value of 5 and scores on the questionnaire)	95% BCa bootstrapped CI of the difference	Effect size (Cohen's d)
L1 Speaking	1560	4.75 (.72)	-0.29, -0.21 (which equals a CI that will fall between 4.71, 4.79)	-0.29, -0.22 (4.71, 7.78)	$(4.75 - 5)/.72 = -0.35$
L1 Comprehension	1560	4.83 (.61)	-0.21, -0.14 (4.79, 4.86)	-0.21, -0.15 (4.79, 4.85)	.28
L1 Reading	1560	4.74 (.76)	-0.30, -0.22 (4.70, 4.78)	-0.30, -0.22 (4.70, 4.78)	.34
L1 Writing	1560	4.59 (.94)	-0.46, -0.36 (4.54, 4.64)	-0.46, -0.37 (4.54, 4.63)	.47

The confidence intervals do not run through zero, meaning that we can reject the null hypothesis that the participants rated themselves as fully proficient in their L1, but the confidence interval for their proficiency ratings are all in the 4s and most quite narrow and closer to 5. Because the group size is so large the confidence intervals are quite precise, meaning we have strong confidence that the true scores will be in a very small range, and very close to 5, but not quite 5. The effect sizes are small meaning that their difference from the neutral value (that we chose) of 5 is not very significant and not very large.