

10.9: SPSS Lesson 7- Paired Sample t-Test

To follow along, load in the [Data Set](#) “Methadone.sav”:

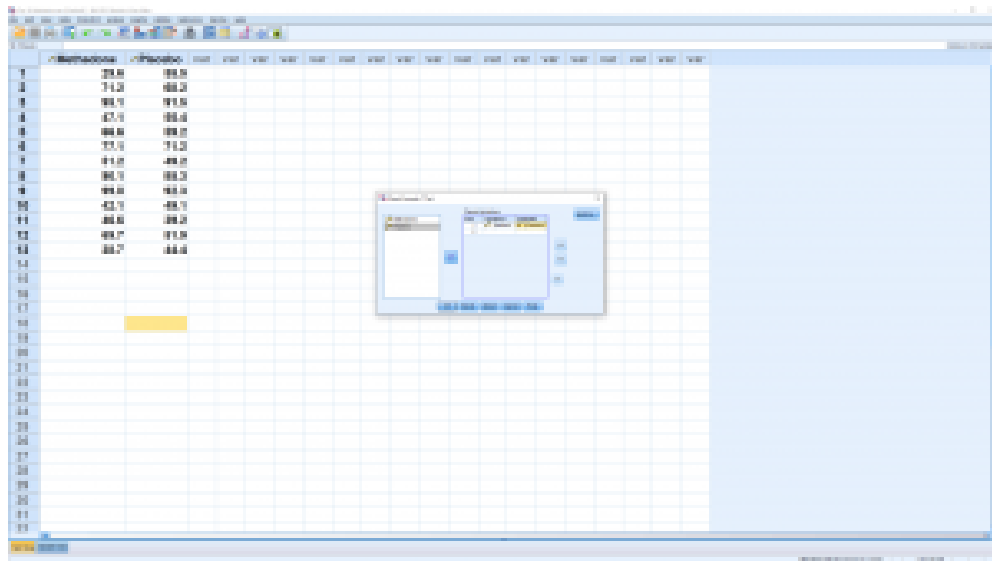
	Methadone	Methadone_2
1	100.0	100.0
2	71.2	68.2
3	100.0	91.0
4	102.0	100.0
5	100.0	100.0
6	71.2	71.2
7	101.0	100.0
8	100.0	100.0
9	100.0	100.0
10	102.0	100.0
11	100.0	100.0
12	100.0	101.0
13	100.0	100.0
14	100.0	100.0
15	100.0	100.0
16	100.0	100.0
17	100.0	100.0
18	100.0	100.0
19	100.0	100.0
20	100.0	100.0
21	100.0	100.0
22	100.0	100.0
23	100.0	100.0
24	100.0	100.0
25	100.0	100.0
26	100.0	100.0
27	100.0	100.0
28	100.0	100.0
29	100.0	100.0
30	100.0	100.0
31	100.0	100.0
32	100.0	100.0
33	100.0	100.0
34	100.0	100.0
35	100.0	100.0
36	100.0	100.0
37	100.0	100.0
38	100.0	100.0
39	100.0	100.0
40	100.0	100.0
41	100.0	100.0
42	100.0	100.0
43	100.0	100.0
44	100.0	100.0
45	100.0	100.0
46	100.0	100.0
47	100.0	100.0
48	100.0	100.0
49	100.0	100.0
50	100.0	100.0

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As set up, the file has two dependent variables. This “within subjects” dataset is fundamentally multivariate. When we did the paired t -test by hand we converted the multivariate data to univariate data by taking differences. SPSS will do the differences behind the scene and you won’t actually see them. Run the t -test by picking Analyze → Compare Means → Paired -Samples T-Test:

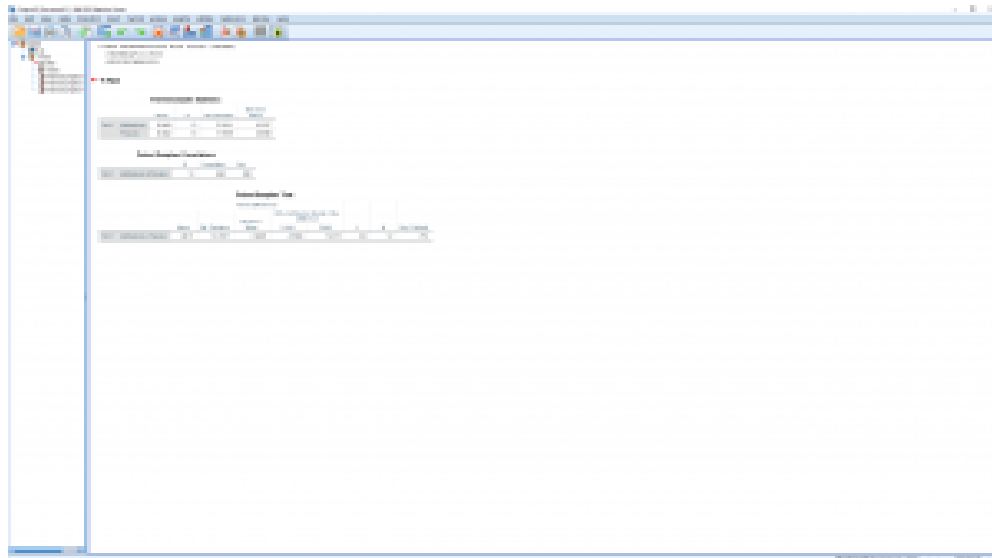
SPSS screenshot © International Business Machines Corporation.

Move the two variables into Pair 1 and hit OK (Options again allows you to specify a confidence intervals percentage):



SPSS screenshot © International Business Machines Corporation.

The output is:



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The first two tables are descriptive statistics. The last table gives the stuff we want: $\bar{D} = 0.9615$, $s_D = 10.7067$, the confidence interval

$$-5.5084 < \mu_D < 7.4315,$$

$t_{\text{test}} = 0.324$, $\nu = 12$ and $p = 0.002$ for the two-tailed hypotheses pair

$$H_0: \mu_D = 0$$

$$H_1: \mu_D \neq 0.$$

The very low p -value (0 in this case) and the absence of 0 in the confidence interval guide us to reject H_0 , the differences are significantly different from zero.

The standardized effect size and strength of association for the paired t -test are

$$d = \frac{t}{\sqrt{n}} = \frac{\bar{D}}{s_D}$$

and

$$\eta^2 = \frac{t^2}{t^2 + n - 1}$$

respectively.

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