

A statistics tutor surveyed her class of 15 students about the time they spend on Instagram. Her students wrote the estimated minutes per day they spend on Instagram. When the data was collected it was revealed that the students spent an average of 80.67 minutes a day on Instagram. A robust debate ensued in the class and the students decided they would attempt to reduce the time they spent on Instagram. Their tutor said “Perfect! We’ll collect more data next week and test whether you have managed to significantly reduce your Insta-minutes.”

Step 1 – Taking a look at the data.

The screenshot shows the 'DATA VARIABLE' configuration window for 'Insta-minutes time 2'. The description is 'Minutes per day spent on Instagram in Week 2'. The 'Measure type' is set to 'Continuous', the 'Data type' is 'Integer (auto)', and 'Missing values' is empty. Below the configuration is a data spreadsheet with two columns: 'Insta-minutes time 1' and 'Insta-minutes time 2'. The data for 15 students is as follows:

Student	Insta-minutes time 1	Insta-minutes time 2
1	45	30
2	40	45
3	60	25
4	45	20
5	100	30
6	90	55
7	20	25
8	120	80
9	60	50
10	75	35
11	150	100
12	85	70
13	110	30
14	90	75
15	120	65

Our variables are labelled “Insta-minutes time 1” and “Insta-minutes time 2”. The variables have been specified as continuous variable in Measure type.

In the data spreadsheet are the 30 scores on the Insta-minutes variables obtained from the 15 students in the statistics class. There are two columns, one for Time 1 scores and one for Time 2 scores.

Step 2 – Navigating to the Paired Samples *t*-test analysis menu.

The screenshot shows the 'Analyses' tab in the Jamovi software. The 'T-Tests' menu is open, and 'Paired Samples T-Test' is circled in blue. Other options visible are 'Independent Samples T-Test' and 'One Sample T-Test'. The background shows the same data spreadsheet as in Step 1.

On the Analyses tab select the T-tests menu, then select Paired Samples T-Test. This is an alternate name for the Dependent Means *t*-test.

Step 3 – Selecting analysis options

When you first select the Paired Samples T-Test the following screen will appear. The analysis options appear on the left and the empty results appears on the right, ready to update as you select the analysis options.

Paired Samples T-Test

Paired Variables

Tests

- Student's
- Bayes factor
- Prior: 0.707
- Wilcoxon rank

Additional Statistics

- Mean difference
- Confidence interval: 95 %
- Effect size
- Confidence interval: 95 %
- Descriptives
- Descriptives plots

Hypothesis

- Measure 1 > Measure 2
- Measure 1 < Measure 2
- Measure 1 = Measure 2

Missing values

- Exclude cases analysis by analysis
- Exclude cases listwise

References

[1] The jamovi project (2020). *jamovi*. (Version 1.6) [Computer Software]. Retrieved from <https://www.jamovi.org>.

[2] R Core Team (2020). *R: A Language and environment for statistical computing*. (Version 4.0) [Computer software]. Retrieved from <https://cran.r-project.org>. (R packages retrieved from MRAN snapshot 2020-08-24).

To run our paired samples/dependent means *t*-test we need to move our Time 1 and Time 2 variables across into the “paired variables” box.

Paired Samples T-Test

Paired Variables

Insta-minute... Insta-minute...

You can now see that our two variables appear linked in the paired variables box. This tells *jamovi* that we want to examine the difference scores between our Time 1 and Time 2 variables in our *t*-test.

Doing this provides us with some bare bones results for our dependent means *t*-test.

Results

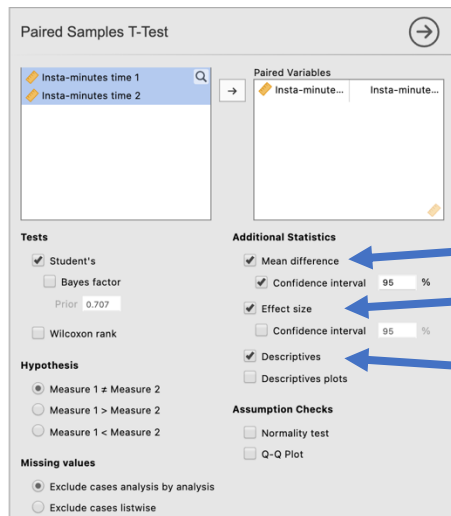
Paired Samples T-Test

Paired Samples T-Test		statistic	df	p	
Insta-minutes time 1	Insta-minutes time 2	Student's t	4.86882	14.00000	0.00025

The “Statistic” value is the *t* score we would calculate if we calculated it by hand. We are also given the degrees of freedom (14, given that we have a sample of 15 and $df = N - 1$).

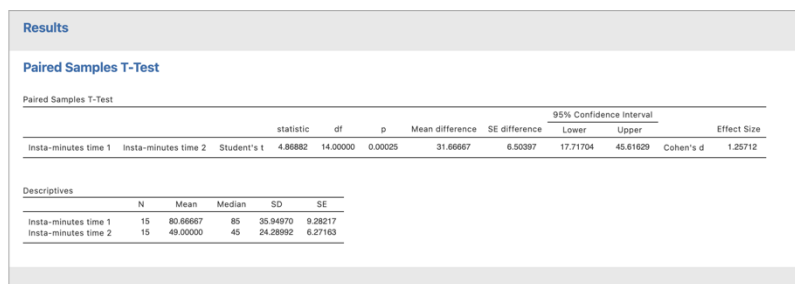
Our *p* value here is .00025. This value is less than .05 so we will reject the null hypothesis that there is no difference in minutes spent on Instagram by the statistics students at Time 1 and Time 2.

We need to ask for some additional statistics to aid our interpretation and write up of the results.

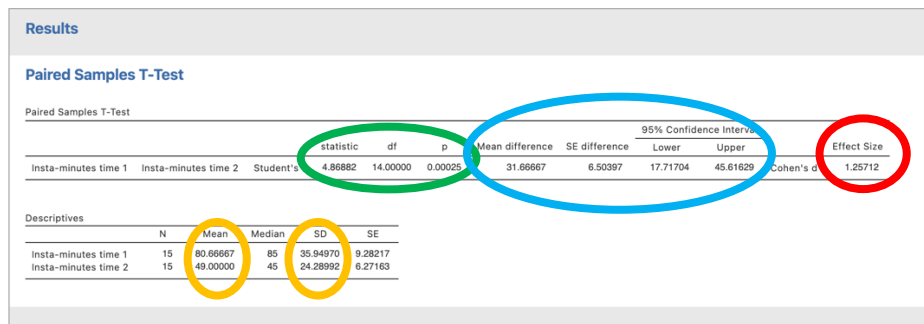


Additional statistics that are helpful to ask for are descriptives and the mean difference to help you describe the pattern of results. The effect size helps you describe the magnitude of the result you have obtained. You can also ask for confidence intervals around the effect size or the mean difference. We'll ask for these for our mean difference in this instance.

Step 4 – Finding the components for reporting.



Here we have all the information to write up a detailed results paragraph. Let's pull the components out and see where they fit into the write up.



The four key components here are:

1. **The *t* score, *df* and *p* value** – the *t*-test result
2. **An effect size** in the form of Cohen's *d*.
3. **The mean difference and associated confidence interval** – the difference between our sample mean and the population mean/test score.
4. **Descriptives** for our data – mean and standard deviation are of most use here.

The Write Up:

Students in the statistics class reduced the average time they spent on Instagram from **80.67 minutes (*SD* = 35.95)** in week one to **49.00 minutes (*SD* = 24.29)** in week two. This **31.67 minute difference (95% *CI* [17.72, 45.62])** represents a significant decrease in Instagram usage, with a large effect size, **$t(14) = 2.98, p < .001, d = 1.26$** .

Tip: In APA format we report our p value to three decimal places. Where our p value would round to .000 we report this as $p < .001$ and not $p = .000$ which would imply our p value is equal to zero when it is not.

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Based on *jamovi* v.1.8.4 ²

¹ The Statistics Working Group was formed in November 2020 to review the use of statistical packages in teaching across the core undergraduate statistics unit. The working group is led by Winnifred Louis and Philip Grove, with contributions from Timothy Ballard, Stefanie Becker, Jo Brown, Jenny Burt, Nathan Evans, Mark Horswill, David Sewell, Eric Vanman, Bill von Hippel, Courtney von Hippel, Zoe Walter, and Brendan Zietsch.

² The jamovi project (2021). *jamovi* (Version 1.8.4) [Computer Software]. Retrieved from <https://www.jamovi.org>