

SOURCEBOOK

JASP

DATA ANALYSIS

Abstract: This chapter provides step-by-step instructions on how to obtain basic statistical output using JASP, both visually with screenshots and via written instructions. Simple examples for most undergraduate-level between-subjects and within-subjects research designs are provided.

Keywords: JASP, screenshots, directions for use

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This document is part of an online statistics sourcebook.

A browser-friendly viewing platform for the sourcebook is available:

<https://cwendorf.github.io/Sourcebook>

All data, syntax, and output files are available:

<https://github.com/cwendorf/Sourcebook>

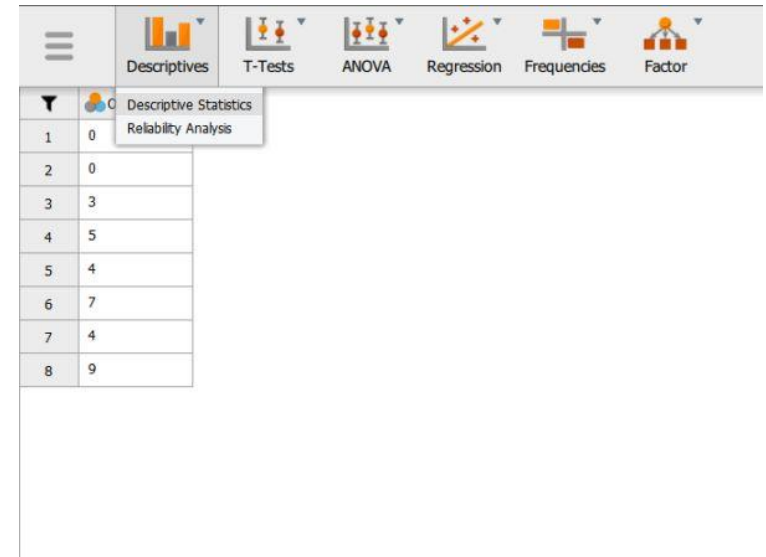
TABLE OF CONTENTS FOR THIS CHAPTER

Frequencies and Descriptives.....	3
Transformations and Standardized Scores	5
Correlations	8
Regression	9
Confidence Interval for a Mean	11
One Sample t Test.....	13
Paired Samples t Test.....	15
Independent Samples t Test	17
OneWay ANOVA.....	19
Post Hoc Comparisons	21
Repeated Measures ANOVA	23
Factorial ANOVA.....	25

Frequencies and Descriptives

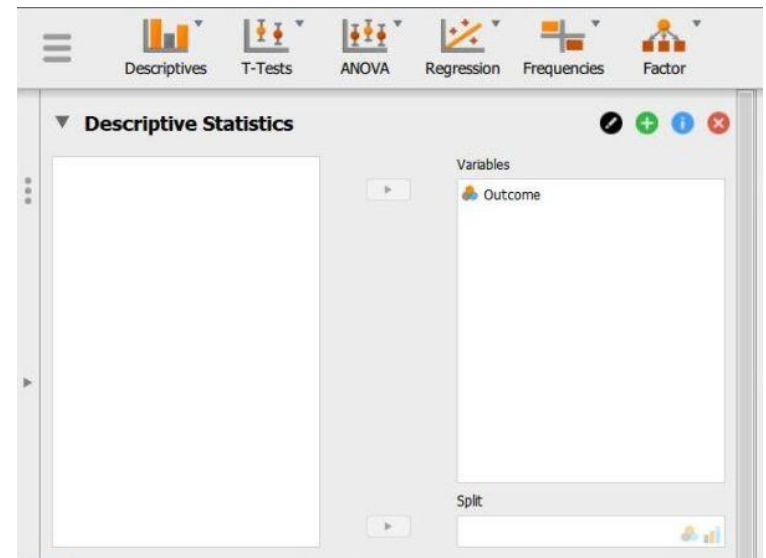
Selecting the Analysis

1. First, enter the data (described elsewhere)
2. In the "Analyses" section of the menu, select the "Descriptives → Descriptive Statistics" option.



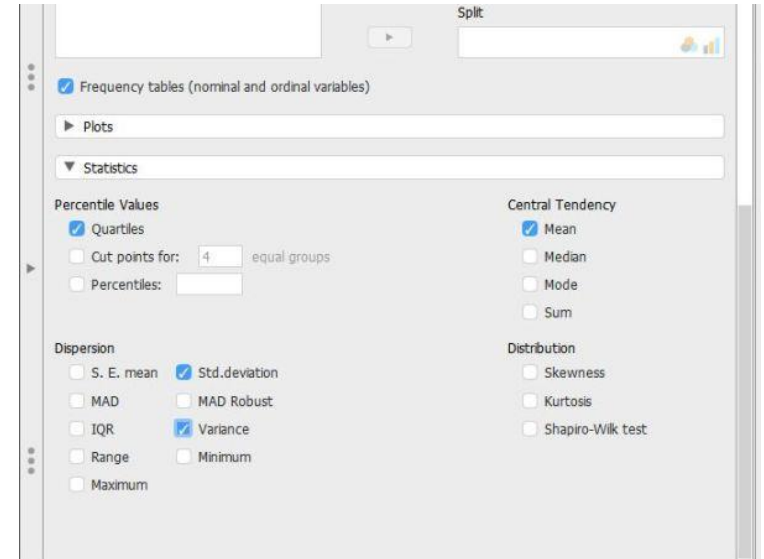
Obtaining Frequencies

3. A set of options will then appear for you to choose the variables and statistics of interest.
4. Select the variables you wish to analyze by clicking on them in the left-hand box and then the arrow to move them into the right-hand box.
5. Be sure that "Display frequency tables" is checked. Without this checked, you will not get a frequency distribution.
6. Output will automatically appear on the right side of the window.



Obtaining Descriptive Statistics

7. Though some basic summary statistics are displayed by default, you can make changes by expanding the “Statistics” drop-down menu.
8. As you select the desired statistics, the output on the right side of the window will be automatically updated.

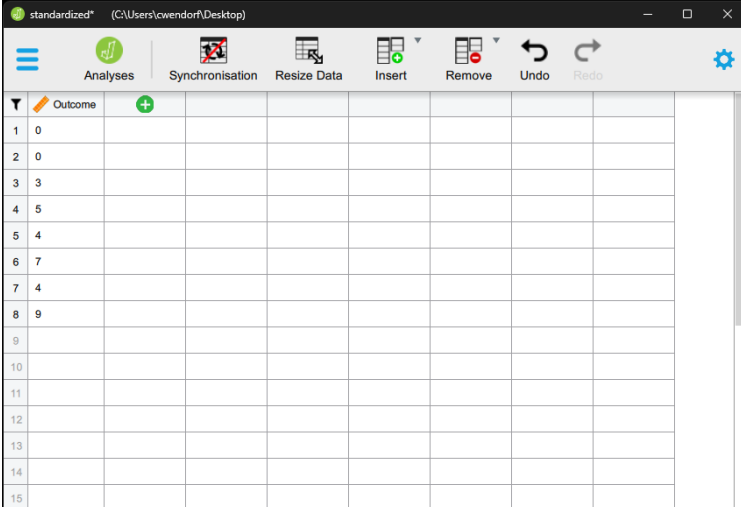


Your data have now been analyzed!

Transformations and Standardized Scores

Selecting the Analysis

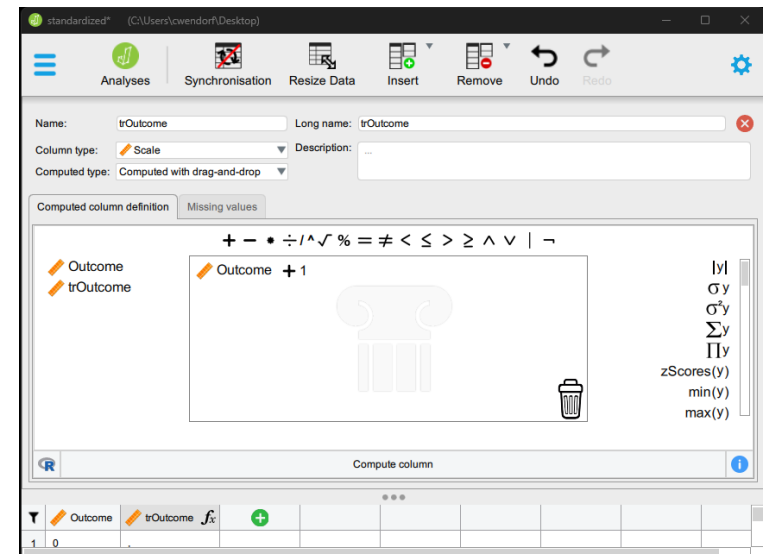
1. First, enter the data (described elsewhere).
2. In the “Edit Data” section of the menu, click on the green “+” sign in the last column. A new box will pop up for you to define the variable.



	Outcome						
1	0						
2	0						
3	3						
4	5						
5	4						
6	7						
7	4						
8	9						
9							
10							
11							
12							
13							
14							
15							

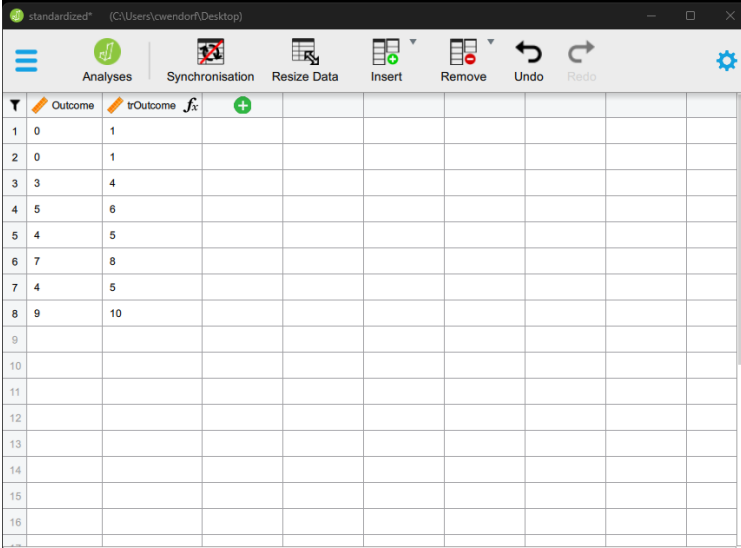
Computing Transformations

3. Type in the new you wish to give the new variable (here it is “trOutcome”). Hit “Enter” to be sure the rest of the cells populate.
4. For “Computed Type”, be sure to select “Computed with Drag and Drop”.
5. In the tab labeled “Computed Column Definition”, drag your original variable (here “Outcome”) to the main box. Click on the math operator (here “+”) and then click on the dots (and type your number).
6. Click on “Compute Column” to finalize the data transformation.
7. To hide the setup menu, click on the large red “X”.



Viewing Transformed Scores

8. Note that transformed variables are not included in the output. Rather, they are saved as new variables in the data view window.
9. These variables can be used in subsequent analyses. You can follow the previous tutorials to get descriptive statistics for these variables.

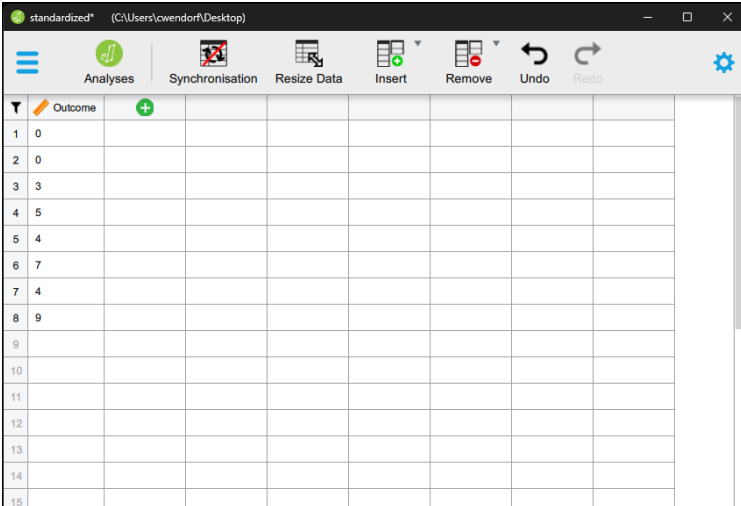


The screenshot shows a software window titled 'standardized' with a menu bar containing 'Analyses', 'Synchronisation', 'Resize Data', 'Insert', 'Remove', 'Undo', and 'Redo'. Below the menu bar is a data table with 16 rows and 8 columns. The first column is labeled 'Outcome' and the second column is labeled 'trOutcome'. The data in the 'trOutcome' column for rows 1 through 8 is as follows:

Row	Outcome	trOutcome
1	0	1
2	0	1
3	3	4
4	5	6
5	4	5
6	7	8
7	4	5
8	9	10
9		
10		
11		
12		
13		
14		
15		
16		

Obtaining Standardized Scores

10. In addition, you can obtain standardized scores. First, enter the data (described elsewhere).
11. In the "Edit Data" section of the menu, click on the green "+" sign in the last column. A new box will pop up for you to define the variable.

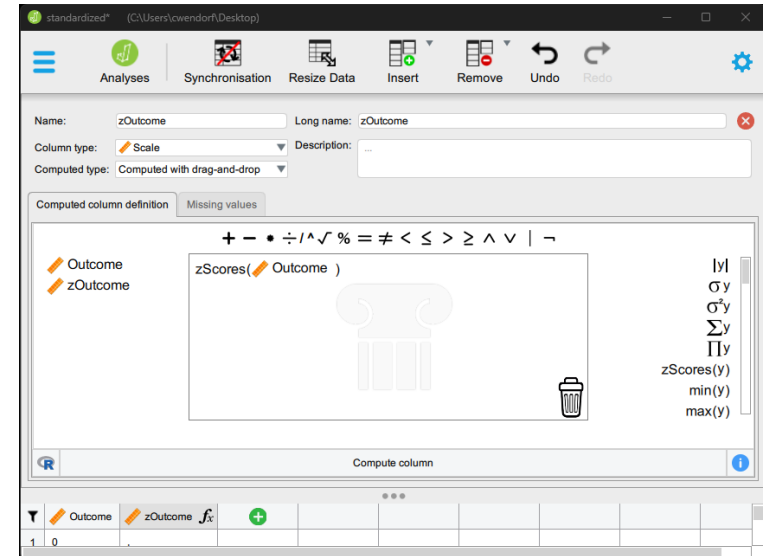


The screenshot shows the same software window as above, but with a new column added to the data table. The first column is labeled 'Outcome' and the second column has a green '+' sign in its header. The data in the 'Outcome' column for rows 1 through 8 is as follows:

Row	Outcome
1	0
2	0
3	3
4	5
5	4
6	7
7	4
8	9
9	
10	
11	
12	
13	
14	
15	

Computing Standardized Scores

12. Type in the new you wish to give the new variable (here it is "zOutcome"). Hit "Enter" to be sure the rest of the cells populate.
13. For "Computed Type", be sure to select "Computed with Drag and Drop".
14. In the tab labeled "Computed Column Definition", click on "zScores(y)" on the right. Drag your original variable (here "Outcome") to take the place of the "y" variable.
15. Click on "Compute Column" to finalize the data transformation.
16. To hide the setup menu, click on the large red "X".



Viewing Standardized Scores

17. Note that standardized variables are not included in the output. Rather, they are saved as new variables in the data view window.
18. These variables can be used in subsequent analyses. You can follow the previous tutorials to get descriptive statistics for these variables.

The screenshot shows the 'standardized' software interface with the data view window. The table displays the original 'Outcome' variable and the newly computed 'zOutcome' variable for 16 rows of data.

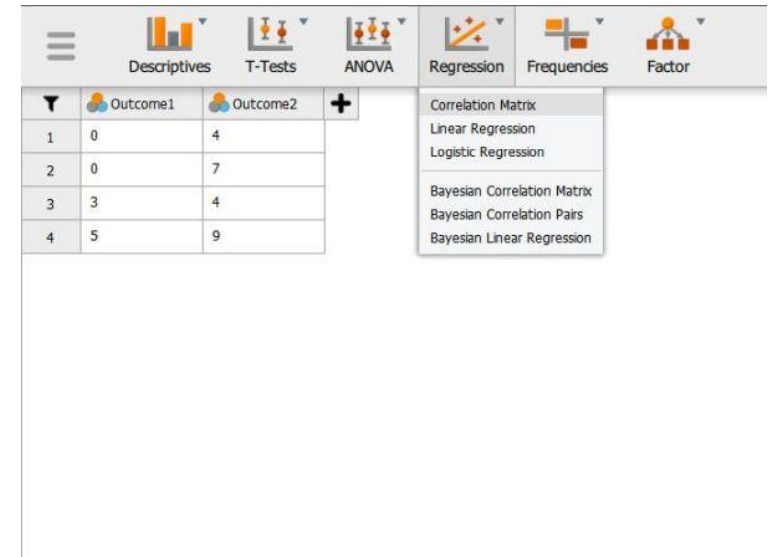
	Outcome	zOutcome
1	0	-1.283377896
2	0	-1.283377896
3	3	-0.320844474
4	5	0.320844474
5	4	0
6	7	0.9625334219
7	4	0
8	9	1.60422237
9		
10		
11		
12		
13		
14		
15		
16		

Your data have now been analyzed!

Correlations

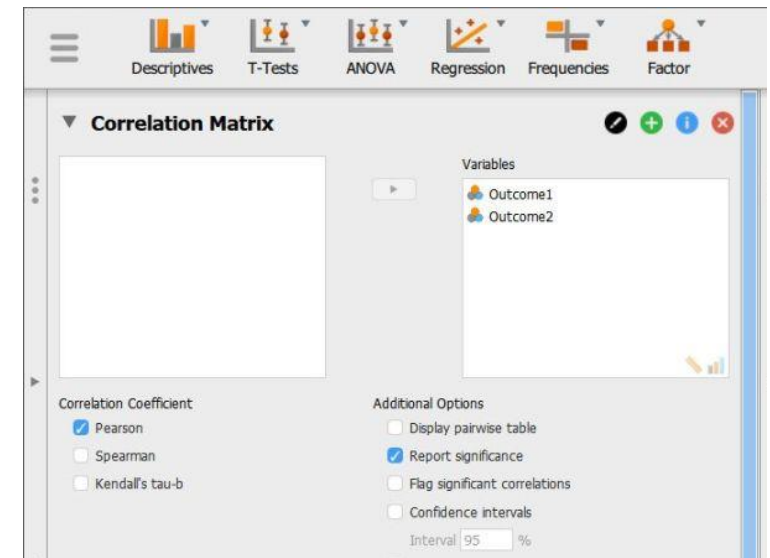
Selecting the Analysis

1. First, enter data involving multiple variables (described elsewhere).
2. In the "Analyses" section of the menu, select the "Regression → Correlation Matrix" option.



Obtaining Inferential Statistics

3. A set of options will then appear for you to choose the variables and statistics of interest.
4. Select the variables you wish to analyze by clicking on them in the left-hand box and then the arrow to move them into the right-hand box.
5. Output (with no descriptive statistics) will automatically appear on the right side of the window.
6. If you wish descriptive statistics associated with each variable, follow the "Descriptives" procedures described earlier in this manual.

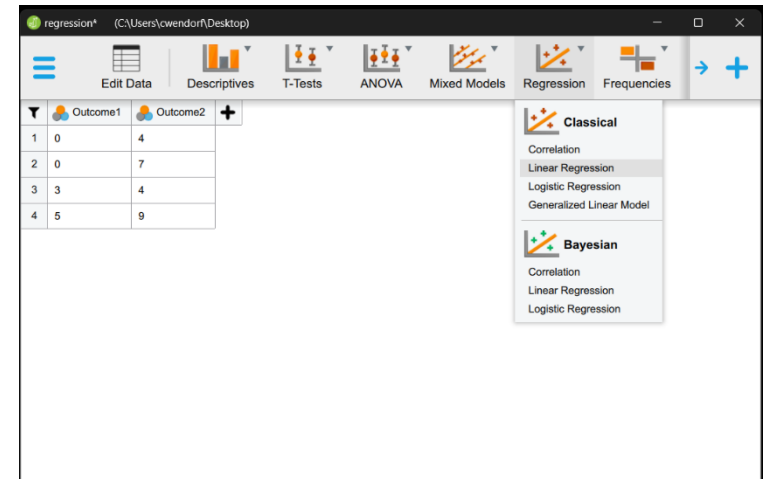


Your data have now been analyzed!

Regression

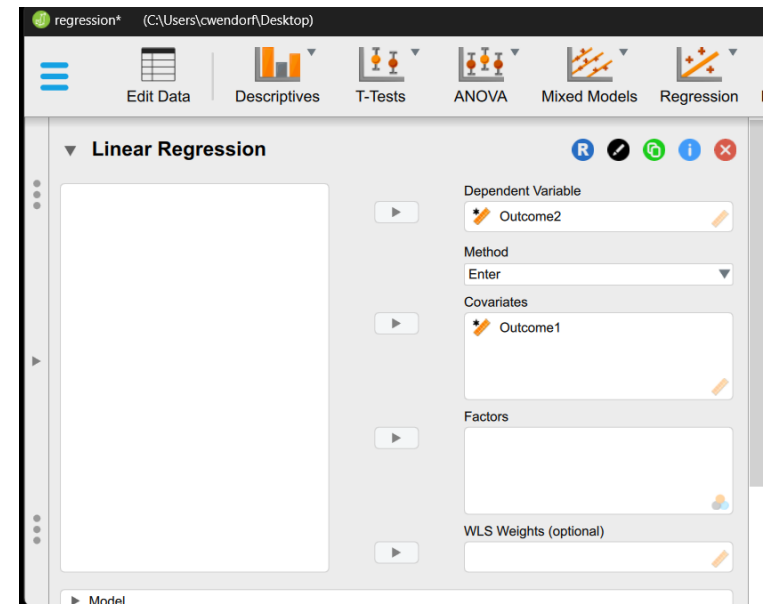
Selecting the Analysis

1. First, enter data involving multiple variables (described elsewhere).
2. In the "Analyses" section of the menu, select the "Regression → Linear Regression" option (from the "Classical" section).



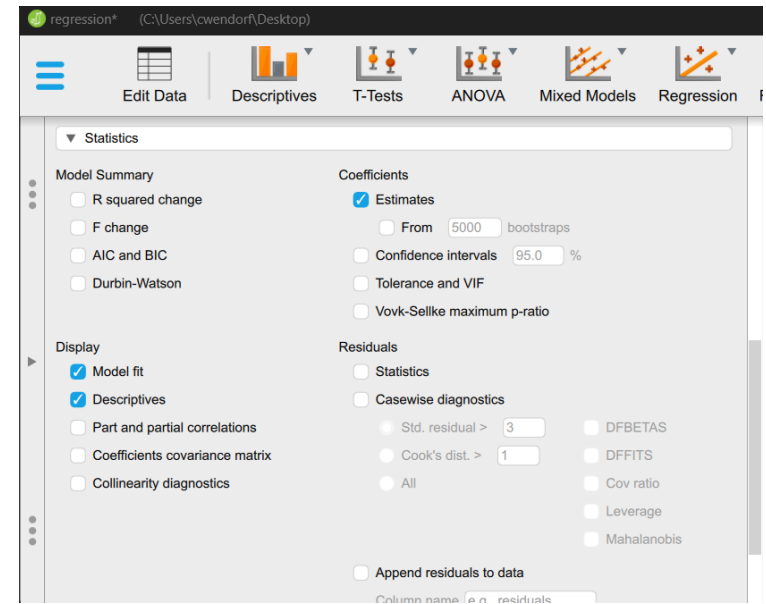
Obtaining Inferential Statistics

3. A set of options will then appear for you to choose the variables and statistics of interest.
4. Select the variables you wish to analyze by clicking on them in the left-hand box and then the arrow to move them into the right-hand boxes. Your Predictor (here "Outcome1") should go under "Covariates" and your Outcome (here "Outcome2") should go in as the "Dependent Variable".
5. Output (with no descriptive statistics) will automatically appear on the right side of the window.



Obtaining Additional Statistics

6. Scroll down to the section on “Statistics”. Check “Display | Descriptives” and “Coefficients | Estimates”.
7. Updated output will automatically appear on the right side of the window.

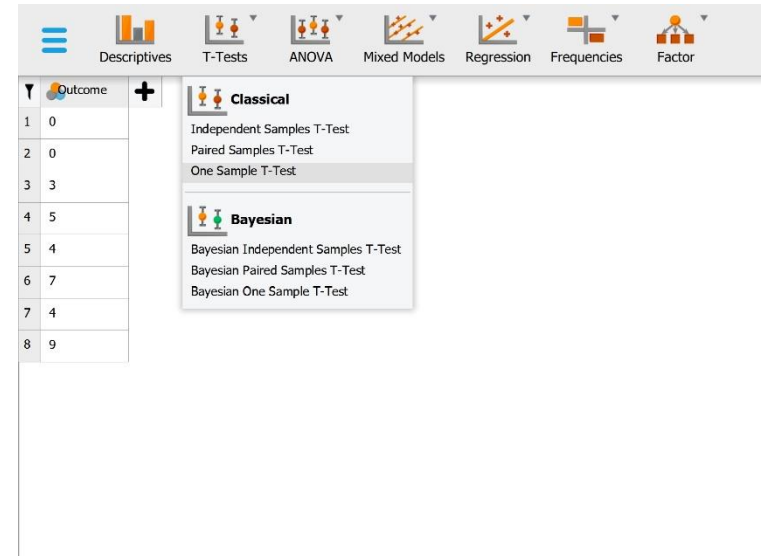


Your data have now been analyzed!

Confidence Interval for a Mean

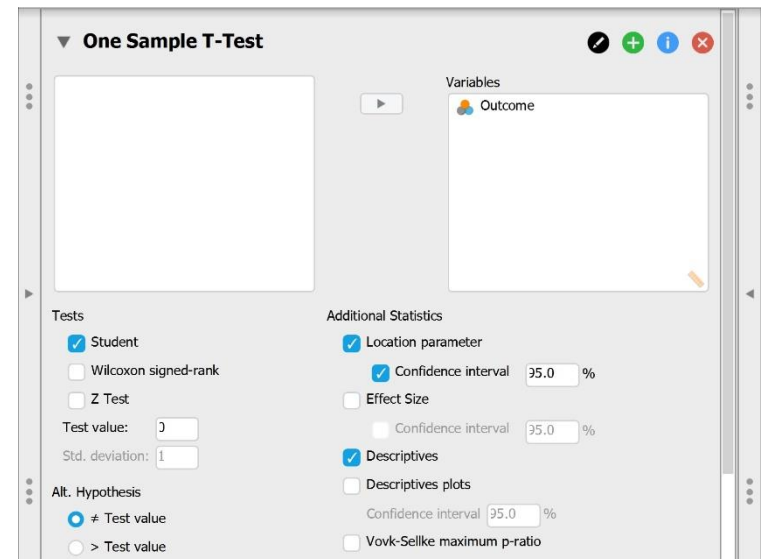
Obtaining One-Sample Inferential Statistics

1. First, enter the data (described elsewhere).
2. In the "Analyses" section of the menu, select the "T-Tests → One Sample T-Test" option.



Choosing Variables

3. A set of options will then appear for you to choose the variables and statistics of interest.
4. Select the variable you wish to analyze by clicking on it in the left-hand box and then the arrow to move it into the right-hand box.
5. Output will automatically appear on the right side of the window.



Obtaining Inferential Statistics

6. To get the confidence interval for the mean, make sure the “Test Value” is set to zero.
7. Check the “Confidence Interval” box (and alter the width of the interval if desired).
8. Similarly, select other options that are important for you: “Descriptives” will offer a mean and standard deviation for the variable; and “Descriptives plots” will provide a graph of the confidence interval.
9. Updated output will automatically appear on the right side of the window.

The image shows the 'Tests' dialog box in SPSS, which is used to configure statistical tests for a one-sample t-test. The dialog is divided into several sections:

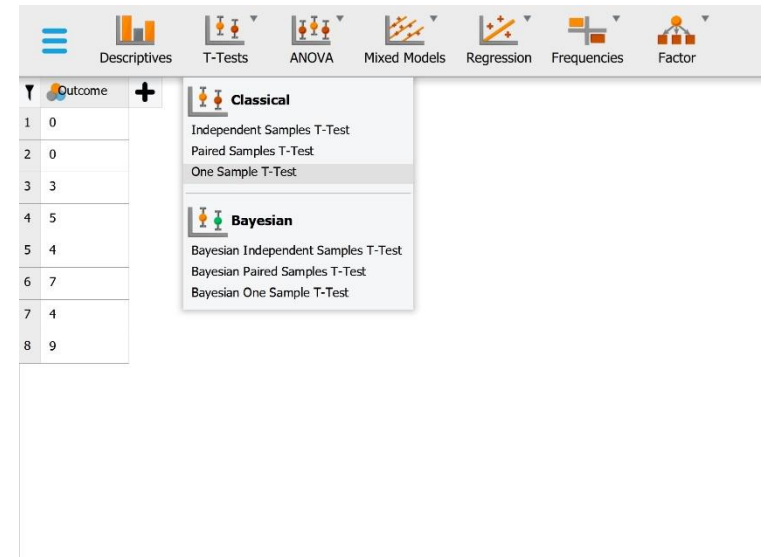
- Tests:** Contains checkboxes for 'Student' (checked), 'Wilcoxon signed-rank', and 'Z Test'. Below these are input fields for 'Test value:' (set to 0) and 'Std. deviation:' (set to 1).
- Alt. Hypothesis:** Contains radio buttons for '≠ Test value' (selected), '> Test value', and '< Test value'.
- Assumption checks:** Contains a checkbox for 'Normality'.
- Additional Statistics:** Contains checkboxes for 'Location parameter' (checked), 'Confidence interval' (checked, with a dropdown set to 95.0 %), 'Effect Size', 'Descriptives' (checked), 'Descriptives plots' (unchecked, with a dropdown set to 95.0 %), and 'Vovk-Selike maximum p-ratio'.
- Missing Values:** Contains radio buttons for 'Exclude cases per dependent variable' (selected) and 'Exclude cases listwise'.

Your data have now been analyzed!

One Sample t Test

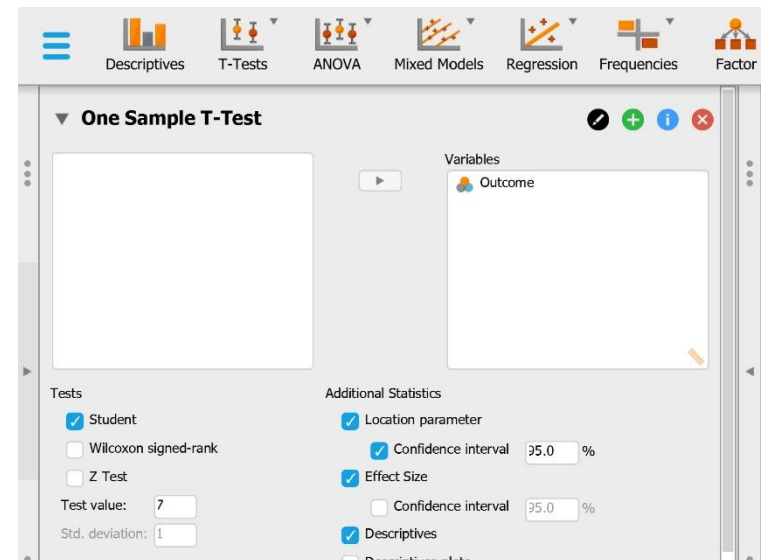
Selecting the Analysis

1. First, enter the data (described elsewhere)
2. In the "Analyses" section of the menu, select the "T-Tests → One Sample T-Test" option.



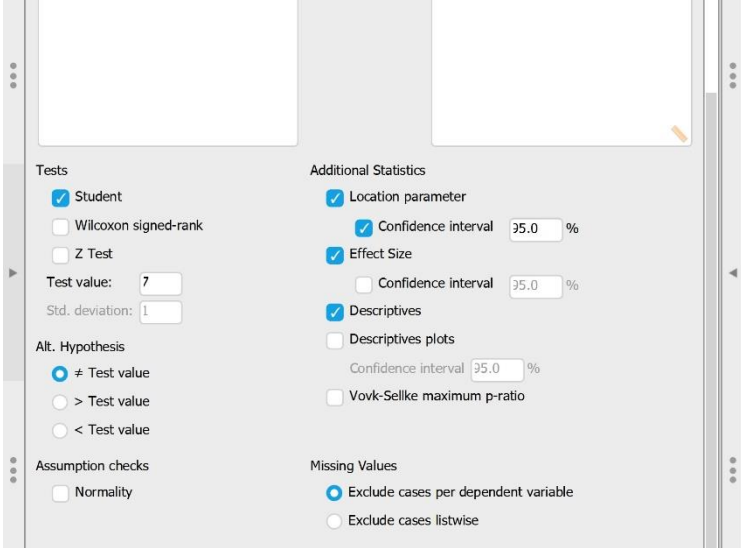
Obtaining Inferential Statistics

3. A set of options will then appear for you to choose the variables and statistics of interest.
4. Select the variable you wish to analyze by clicking on it in the left-hand box and then the arrow to move it into the right-hand box.
5. Be sure to enter a known or hypothesized mean into the "Test Value" field. If you do not enter a value here, JASP will automatically use zero as the comparison mean.
6. Output will automatically appear on the right side of the window.



Obtaining Additional Statistics

7. Select the options that are important for you: “Location parameter” will display the size of the difference between the two means; “Effect size” will display Cohen’s d; and “Descriptives” will offer a mean and standard deviation for the group.
8. If you wish to view (and alter) the widths of the confidence intervals, check the relevant “Confidence Interval” boxes.
9. Updated output will automatically appear on the right side of the window.



The image shows the 'Additional Statistics' dialog box in SPSS. The 'Tests' section on the left has 'Student' checked, with 'Test value' set to 7 and 'Std. deviation' set to 1. The 'Alt. Hypothesis' section has '≠ Test value' selected. The 'Assumption checks' section has 'Normality' unchecked. The 'Additional Statistics' section on the right has 'Location parameter' checked, 'Confidence interval' checked with a value of 95.0%, 'Effect Size' checked, 'Descriptives' checked, 'Descriptives plots' unchecked, 'Confidence interval' checked with a value of 95.0%, and 'Vovk-Sellke maximum p-ratio' unchecked. The 'Missing Values' section at the bottom has 'Exclude cases per dependent variable' selected.

Tests

- ☒ Student
- ☐ Wilcoxon signed-rank
- ☐ Z Test

Test value: 7

Std. deviation: 1

Alt. Hypothesis

- ☒ ≠ Test value
- ☐ > Test value
- ☐ < Test value

Assumption checks

- ☐ Normality

Additional Statistics

- ☒ Location parameter
- ☒ Confidence interval 95.0 %
- ☒ Effect Size
- ☐ Confidence interval 95.0 %
- ☒ Descriptives
- ☐ Descriptives plots
- Confidence interval 95.0 %
- ☐ Vovk-Sellke maximum p-ratio

Missing Values

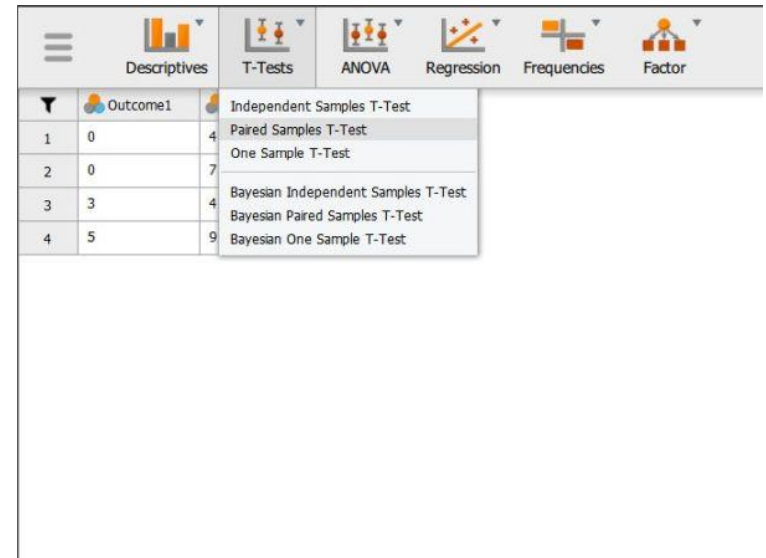
- ☒ Exclude cases per dependent variable
- ☐ Exclude cases listwise

Your data have now been analyzed!

Paired Samples t Test

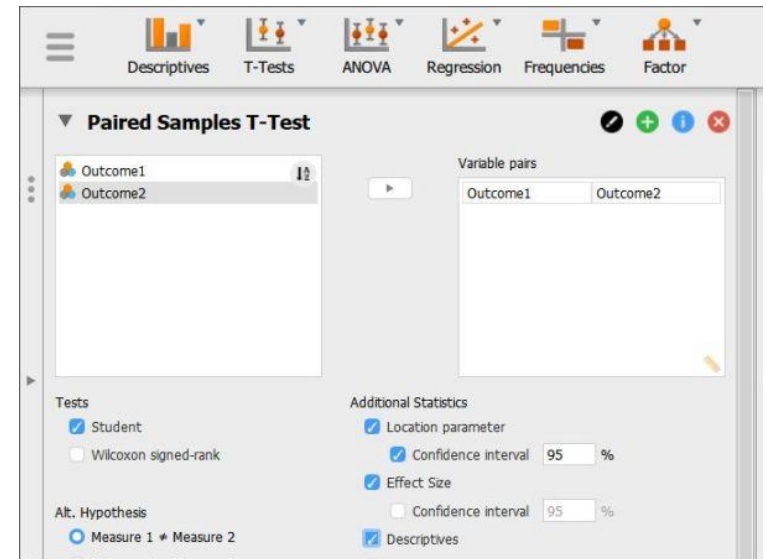
Selecting the Analysis

1. First, enter paired samples data (described elsewhere).
2. In the "Analyses" section of the menu, select the "T-Tests → Paired Samples T-Test" option.



Obtaining Inferential Statistics

3. A set of options will then appear for you to choose the variables and statistics of interest.
4. Select the variables you wish to analyze by clicking on both of them while holding down the "CTRL" key. Then click on the arrow to move the pair of variables to the right-hand box.
5. Output will automatically appear on the right side of the window.



Obtaining Additional Statistics

6. Select the options that are important for you: “Location parameter” will display the size of the difference between the two means; “Effect size” will display Cohen’s d; and “Descriptives” will offer means and standard deviations for each variable.
7. If you wish to view (and alter) the widths of the confidence intervals, check the “Confidence Interval” boxes.
8. Updated output will automatically appear on the right side of the window.

The screenshot shows the SPSS 'Additional Statistics' dialog box for a two-sample t-test. The dialog is divided into several sections:

- Tests:** The 'Student' option is selected with a checked checkbox. The 'Wilcoxon signed-rank' option is unselected.
- Alt. Hypothesis:** The 'Measure 1 ≠ Measure 2' option is selected with a radio button. The other two options, 'Measure 1 > Measure 2' and 'Measure 1 < Measure 2', are unselected.
- Assumption Checks:** The 'Normality' option is unselected.
- Additional Statistics:** The 'Location parameter' option is selected with a checked checkbox. Below it, the 'Confidence interval' is set to 95%. The 'Effect Size' option is also selected with a checked checkbox, and its 'Confidence interval' is also set to 95%. The 'Descriptives' option is selected with a checked checkbox. Below it, the 'Descriptives plots' option is unselected, and the 'Confidence interval' is set to 95%. The 'Vovk-Selike maximum p-ratio' option is unselected.
- Missing Values:** The 'Exclude cases analysis by analysis' option is selected with a radio button. The 'Exclude cases listwise' option is unselected.

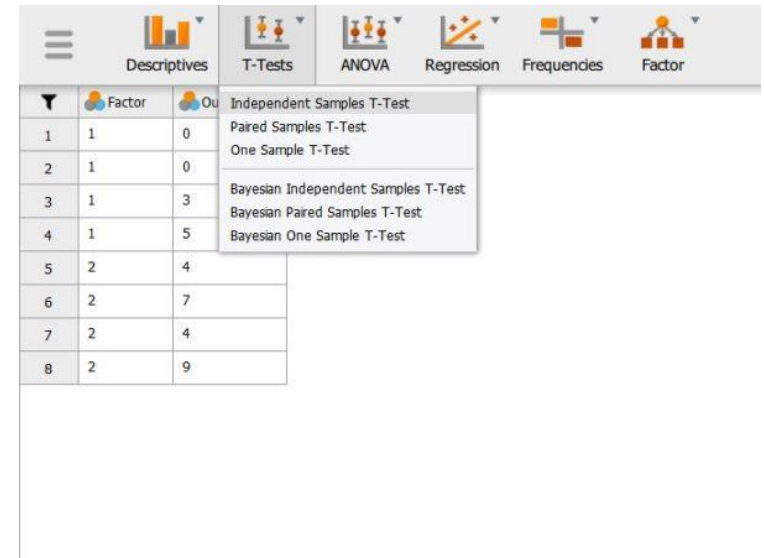
The background of the dialog shows two empty output windows labeled 'Outcome1' and 'Outcome2'.

Your data have now been analyzed!

Independent Samples t Test

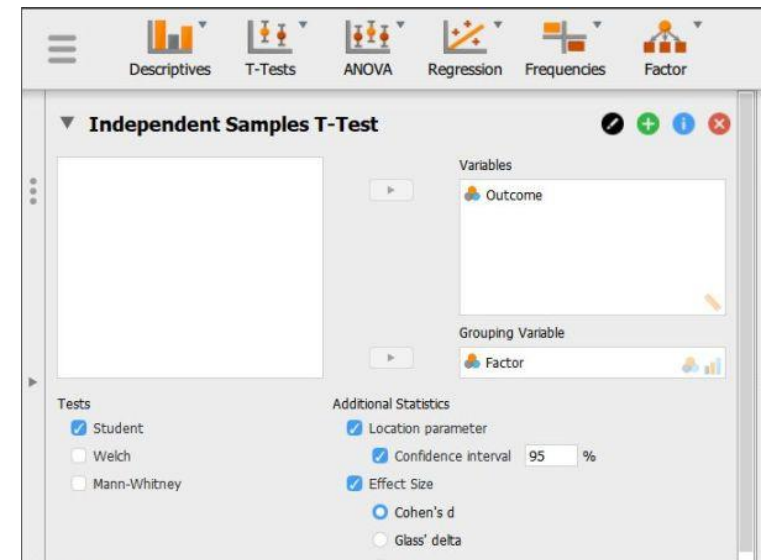
Selecting the Analysis

1. First, enter two sample data (described elsewhere).
2. In the "Analyses" section of the menu, select the "T-Tests → Independent Samples T-Test" option.



Obtaining Inferential Statistics

3. A set of options will then appear for you to choose the variables and statistics of interest.
4. Select the outcome variable and click the arrow to move it into the "Dependent Variables" box.
5. Move the Independent Variable to the "Grouping Variable" box.
6. Output will automatically appear on the right side of the window.



Obtaining Additional Statistics

7. Select the options that are important for you: “Location parameter” will display the size of the difference between the two group’s means; “Effect size” will display Cohen’s d; and “Descriptives” will offer means and standard deviations for each group.
8. If you wish to view (and alter) the widths of the confidence intervals, check the “Confidence Interval” boxes.
9. Updated output will automatically appear on the right side of the window.

The screenshot shows the 'Additional Statistics' dialog box in SPSS. At the top, the 'Grouping Variable' is set to 'Factor'. The dialog is divided into several sections:

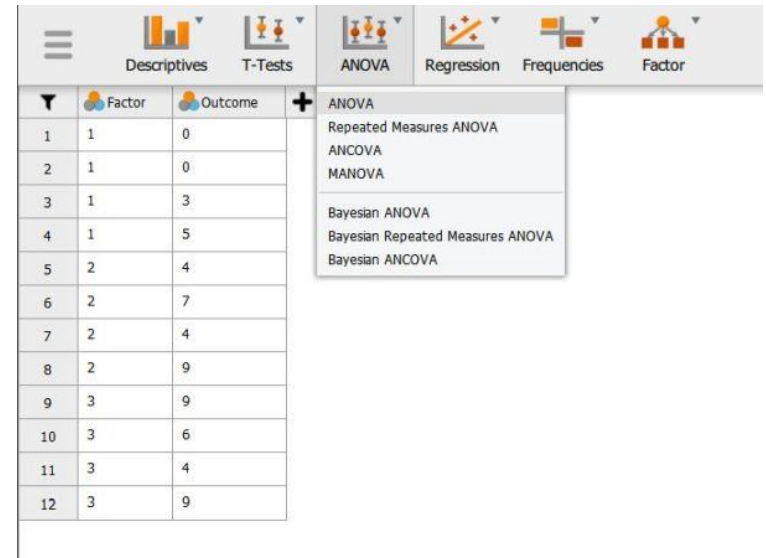
- Tests:** ☒ Student, ☐ Welch, ☐ Mann-Whitney.
- Alt. Hypothesis:** ☒ Group 1 ≠ Group 2, ☐ Group 1 > Group 2, ☐ Group 1 < Group 2.
- Assumption Checks:** ☐ Normality, ☐ Equality of variances.
- Additional Statistics:** ☒ Location parameter (with ☒ Confidence interval 95 %), ☒ Effect Size (with ☒ Cohen's d, ☐ Glass' delta, ☐ Hedges' g, and ☐ Confidence interval 95 %), ☒ Descriptives (with ☐ Descriptives plots and Confidence interval 95 %), and ☐ Vovk-Sellke maximum p-ratio.
- Missing Values:** ☒ Exclude cases analysis by analysis, ☐ Exclude cases listwise.

Your data have now been analyzed!

OneWay ANOVA

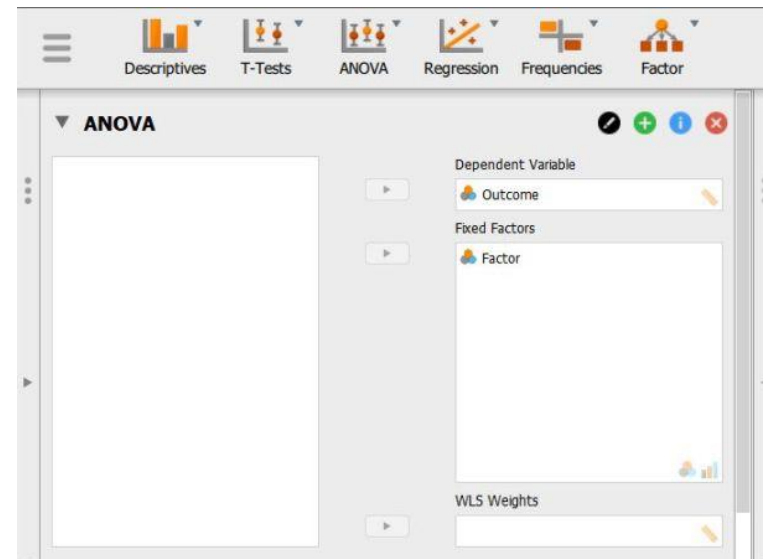
Selecting the Analysis

1. First, enter multiple group data (described elsewhere).
2. In the "Analyses" section of the menu, select the "ANOVA → ANOVA" option.



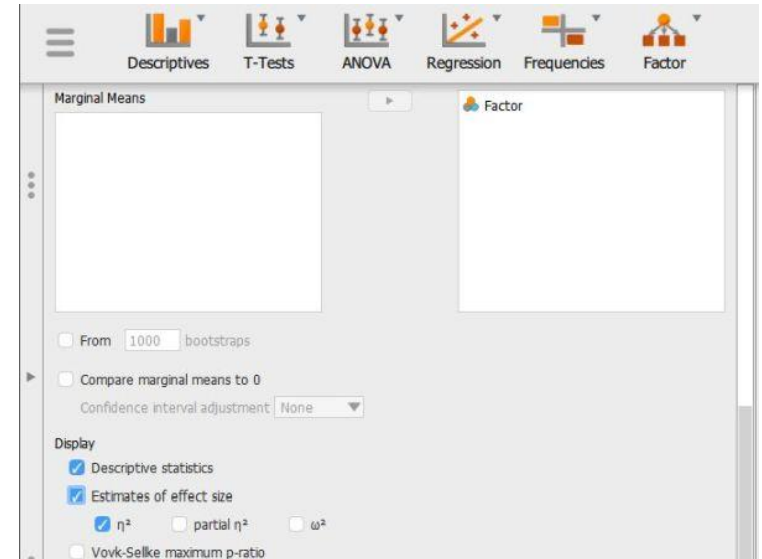
Obtaining Inferential Statistics

3. A set of options will then appear for you to choose the variables and statistics of interest.
4. Select the outcome variable and click the arrow to move it into the "Dependent Variable" box.
5. Move the Factor (Independent Variable) to the "Fixed Factors" box.
6. Output will automatically appear on the right side of the window.



Obtaining Additional Statistics

7. Though some basic summary statistics are displayed by default, you can make changes by expanding the “Additional Options” drop-down menu.
8. Move the factor (Independent Variable) name from the left-hand box for “Marginal means” to the right-hand box.
9. Select options that are important for you: “Estimates of effect size” will display the chosen statistics; and “Descriptive statistics” will offer means and standard deviations for each group.
10. Updated output will automatically appear on the right side of the window.

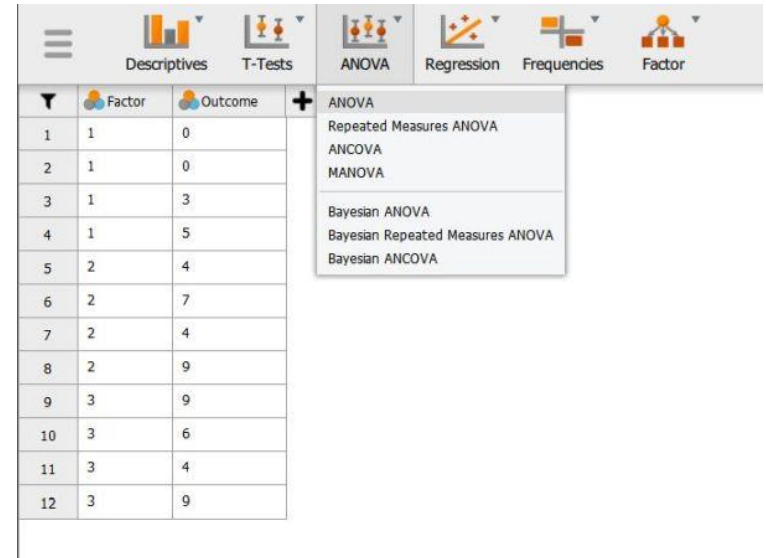


Your data have now been analyzed!

Post Hoc Comparisons

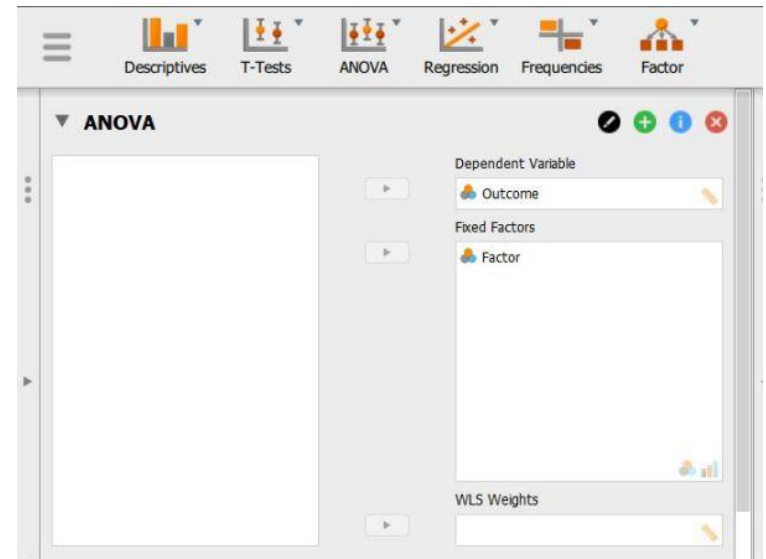
Selecting the Analysis

1. First, enter multiple group data (described elsewhere).
2. In the "Analyses" section of the menu, select the "ANOVA → ANOVA" option.



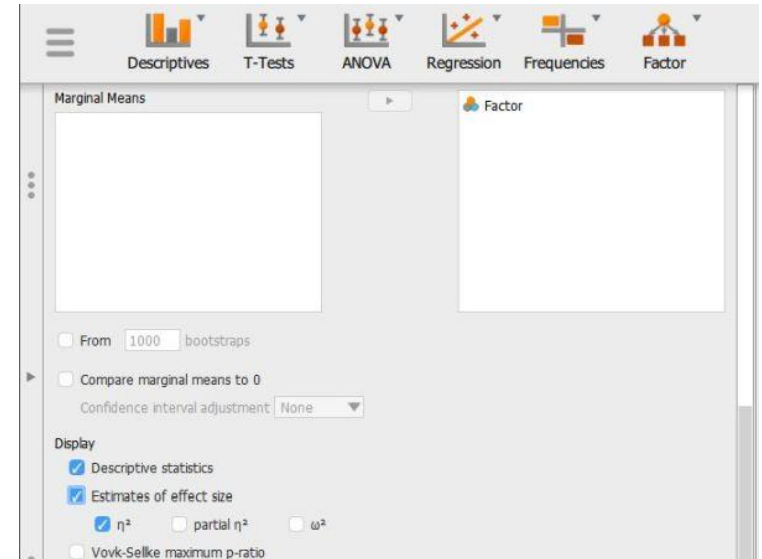
Obtaining Inferential Statistics

3. A set of options will then appear for you to choose the variables and statistics of interest.
4. Select the outcome variable and click the arrow to move it into the "Dependent Variable" box.
5. Move the Factor (Independent Variable) to the "Fixed Factors" box.
6. Output will automatically appear on the right side of the window..



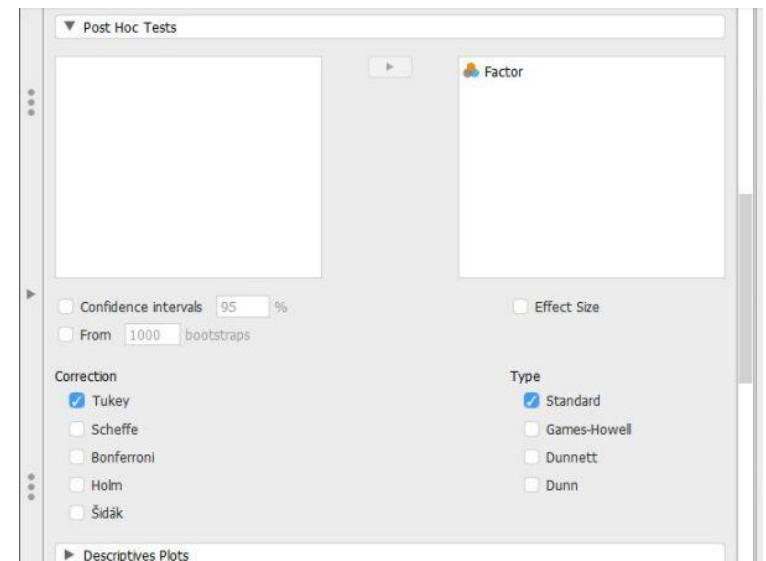
Obtaining Additional Statistics

7. Though some basic summary statistics are displayed by default, you can make changes by expanding the “Additional Options” drop-down menu.
8. Move the factor (Independent Variable) name from the left-hand box for “Marginal means” to the right-hand box.
9. Select options that are important for you: “Estimates of effect size” will display the chosen statistics; and “Descriptive statistics” will offer means and standard deviations for each group.
10. Updated output will automatically appear on the right side of the window.



Steps for Obtaining Post Hoc Tests

11. If you wish to obtain post hoc tests for the purpose of making comparisons between groups, click the “Post Hoc Tests” drop-down button.
12. Move the factor (Independent Variable) name from the left-hand box to the right-hand box.
13. Select “Tukey” to get Tukey HSD post hoc tests (or whatever option you prefer).
14. Updated output will automatically appear on the right side of the window.

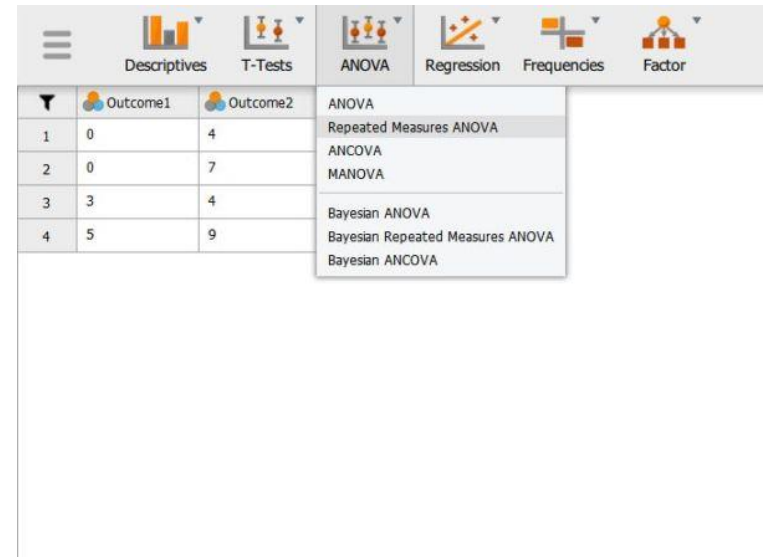


Your data have now been analyzed!

Repeated Measures ANOVA

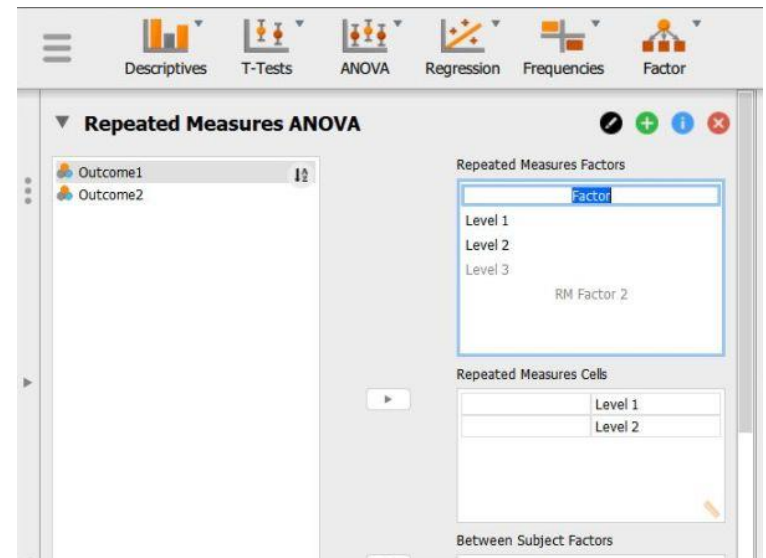
Selecting the Analysis

1. First, enter repeated measures data (described elsewhere).
2. In the "Analyses" section of the menu, select the "ANOVA → Repeated Measures ANOVA".



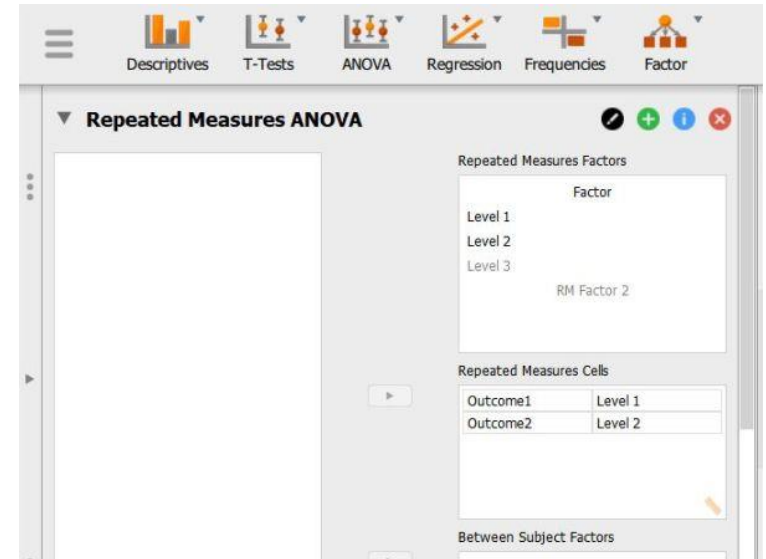
Labeling the Within-Subjects Variable/Factor

3. A set of options will then appear for you to choose the variables and statistics of interest.
4. In the "Repeated Measures Factors" box, you will define the repeated measures factor. This box is necessary for labeling the repeated measurements of the same underlying factor.
5. Click on "RM Factor 1" and type in the name you wish to give to the repeated measures factor. In this example, the measurements/columns reflect quizzes at two different times so "Time" is used as the name.
6. Below that, click on "Level 1" to type the name of the individual level of the repeated measures factor. You may do the same for each level. In this example, the quiz was given twice, so there were only 2 levels of the factor.



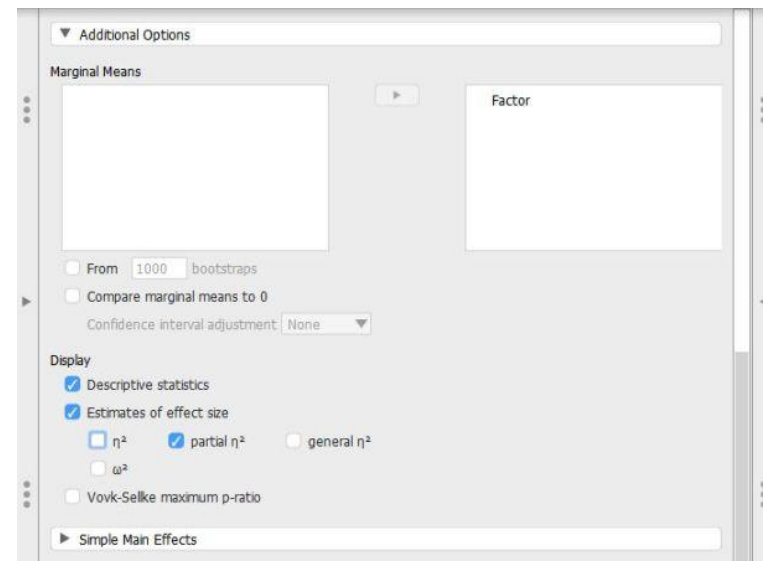
Obtaining Inferential Statistics

7. In the “Repeated Measures Cells” box, you will indicate which measurements/columns in the data set reflect the instances of the repeated measurements.
8. Select the instances you wish to associate with the factor by clicking on them and then arrow to move them. In this example, “t1score” reflects the first level of the factor and “t2score” reflects the second level of the factor.
9. Note that this factor only exists in the computer’s memory. For examples, nowhere in the data set will you see a variable called “Time.”
10. Output will automatically appear on the right side of the window.



Obtaining Additional Statistics

11. Though some basic summary statistics are displayed by default, you can make changes by expanding the “Additional Options” drop-down menu.
12. Select options that are important for you: “Estimates of effect size” will display the chosen statistics; and “Descriptive statistics” will offer means and standard deviations for each group.
13. Updated output will automatically appear on the right side of the window.

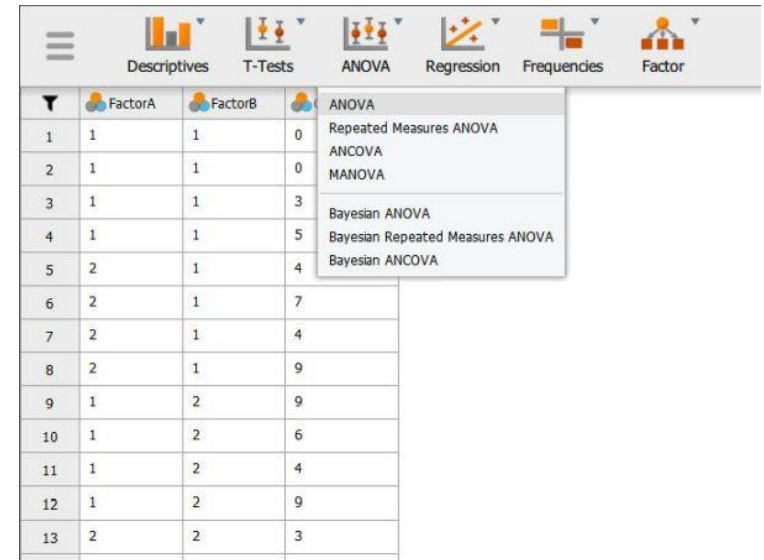


Your data have now been analyzed!

Factorial ANOVA

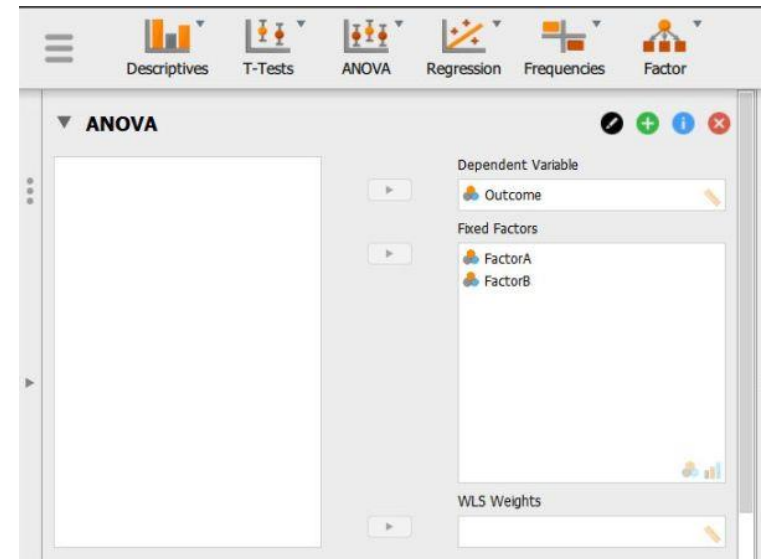
Selecting the Analysis

1. First, enter factorial data (described elsewhere).
2. In the "Analyses" section of the menu, select the "ANOVA → ANOVA" option.



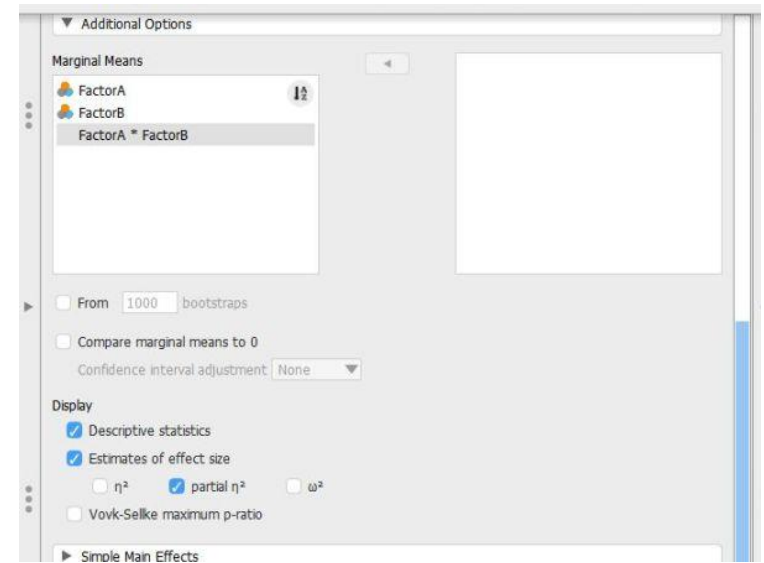
Obtaining Inferential Statistics

3. A set of options will then appear for you to choose the variables and statistics of interest.
4. Select the outcome variable and click the arrow to move it into the "Dependent Variable" box.
5. Move the multiple Factors (Independent Variables) to the "Fixed Factors" box. (The interaction term will be automatically generated in the output.)
6. Output will automatically appear on the right side of the window.



Obtaining Additional Statistics

7. Though some basic summary statistics are displayed by default, you can make changes by expanding the “Additional Options” drop-down menu.
8. Move the factors (Independent Variable) name from the left-hand box for “Marginal means” to the right-hand box. (If you wish cell means for the factorial design, be sure to move the interaction term as well.)
9. Select options that are important for you: “Estimates of effect size” will display the chosen statistics; and “Descriptive statistics” will offer means and standard deviations for each group.
10. Updated output will automatically appear on the right side of the window.



Your data have now been analyzed!