

# **STATISTICS FOR SOCIAL SCIENCE**

## **VOLUME: JASP**

## **CHAPTER: USING THE SOFTWARE**

**Abstract:** This section 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

**Original:** July 2017

**Updated:** November 2019

This document is part of an online statistics sourcebook.

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

<http://www4.uwsp.edu/psych/cw/statistics/sourcebook.htm>

All individual files are available via the Open Science Framework:

<https://osf.io/qe5ym/>

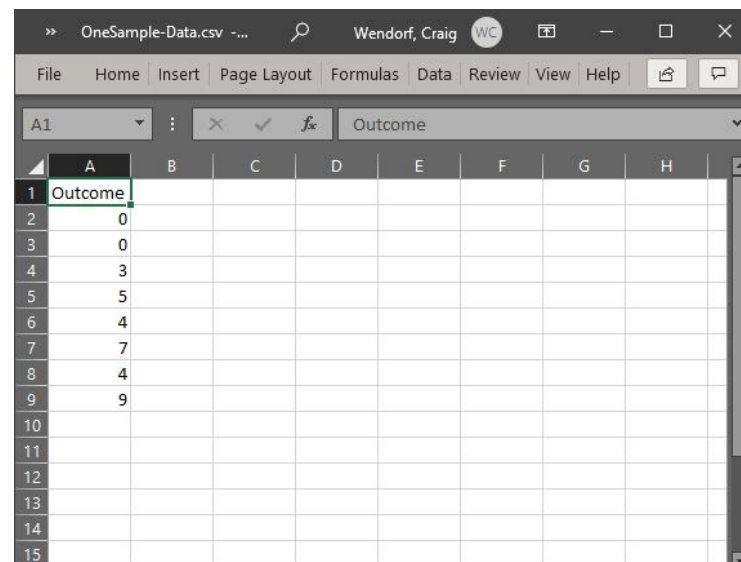
## TABLE OF CONTENTS FOR THIS CHAPTER

Entering One Sample Data .....	3
Entering Repeated Measures Data.....	4
Entering Multiple Sample Data .....	5
Entering Factorial Data .....	6
Descriptives (Frequencies and Descriptive Statistics) .....	7
Correlations (Bivariate).....	9
T Test (One Sample).....	10
T Test (Paired Samples).....	12
T Test (Independent Samples).....	14
ANOVA (OneWay ANOVA) .....	16
Repeated Measures ANOVA .....	18
ANOVA (Factorial ANOVA).....	20

# Entering One Sample Data

## Steps for Entering Data on One Variable (Using a Spreadsheet)

1. In the first row and first cell, type the name of the outcome variable you wish to analyze.
2. Enter the data in the individual cells of the column for the variable. Note that each cell should contain a single score for an individual person. There will be as many rows as people.
3. When saving the file, be sure to save it as a CSV (comma delimited) file.

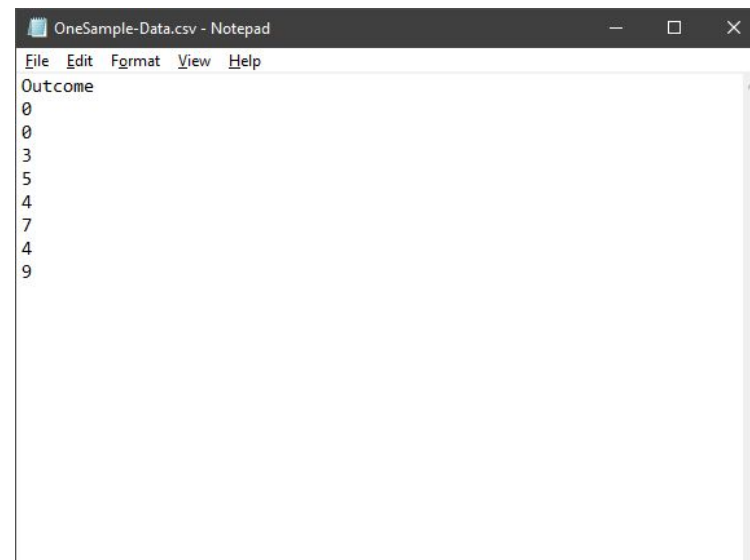


A screenshot of a spreadsheet application window titled 'OneSample-Data.csv'. The window shows a grid with columns A through H and rows 1 through 15. The first row (row 1) has the word 'Outcome' in cell A1. The subsequent rows (rows 2 through 9) have numerical values in column A: 0, 0, 3, 5, 4, 7, 4, and 9 respectively. The rest of the grid is empty.

	A	B	C	D	E	F	G	H
1	Outcome							
2	0							
3	0							
4	3							
5	5							
6	4							
7	7							
8	4							
9	9							
10								
11								
12								
13								
14								
15								

## Steps for Entering Data on One Variable (Using a Text Editor)

1. In the first row, type the name of the outcome variable you wish to analyze.
2. Enter the data in separate rows. Note that each row should contain a single score for an individual person. There will be as many rows as people.
3. When saving the file, be sure to save it as a CSV (comma delimited) file.



A screenshot of a text editor window titled 'OneSample-Data.csv - Notepad'. The window shows a single column of text. The first line is 'Outcome'. The subsequent lines are numerical values: 0, 0, 3, 5, 4, 7, 4, and 9. The rest of the text area is empty.

```
Outcome
0
0
3
5
4
7
4
9
```

**Your data are now ready to be analyzed!**

# Entering Repeated Measures Data

## Steps for Entering Data (Using a Spreadsheet)

1. For repeated measures data, the columns represent the different instances of the within-subjects variable. In the example here, each column is a measurement of the same outcome variable (with the first row labeled accordingly).
2. Notice that each participant has scores on both variables. In this example, each of the five participants has a score for Outcome1 and for Outcome2.
3. When saving the file, be sure to save it as a CSV (comma delimited) file.

	A	B	C	D	E	F	G	H
1	Outcome1	Outcome2						
2	0	4						
3	0	7						
4	3	4						
5	5	9						
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								

## Steps for Entering Data (Using a Text Editor)

1. For repeated measures data, the columns represent the different instances of the within-subjects variable. In the example here, each column is a measurement of the same outcome variable (with the first row labeled accordingly).
2. Notice that each participant has scores on both variables. In this example, each of the five participants has a score for Outcome1 and for Outcome2.
3. When saving the file, be sure to save it as a CSV (comma delimited) file.

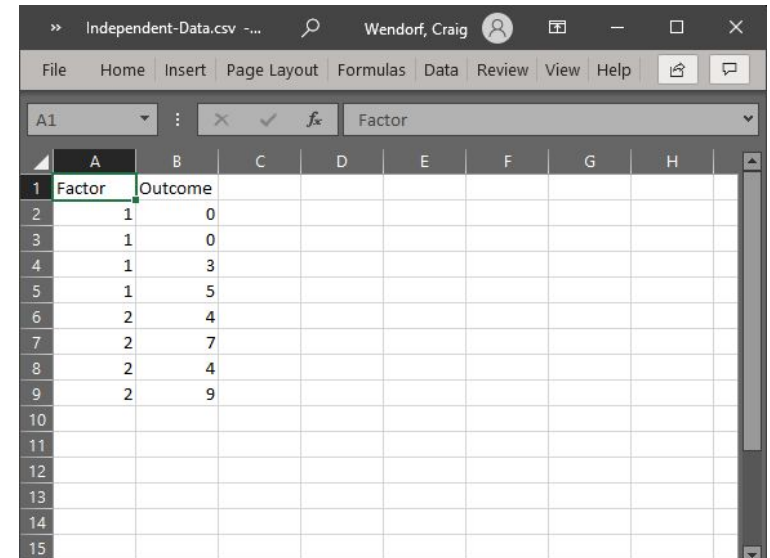
```
Outcome1,Outcome2
0,4
0,7
3,4
5,9
```

**Your data are now ready to be analyzed!**

# Entering Multiple Sample Data

## Steps for Entering Data (Using a Spreadsheet)

1. In the first row, type the names of the variables you wish to analyze. One variable will represent the Factor (Independent Variable) and the other will represent the Outcome (Dependent) Variable.
2. Enter the data for all of the participants. Notice that each participant has scores on both the Factor and Outcome Variables. There will be as many rows as people.
3. On the categorical Factor, use the group number as the value for the individual.
4. If your data set has more than two groups, simply be sure to add a group indicator and a score for each additional person.

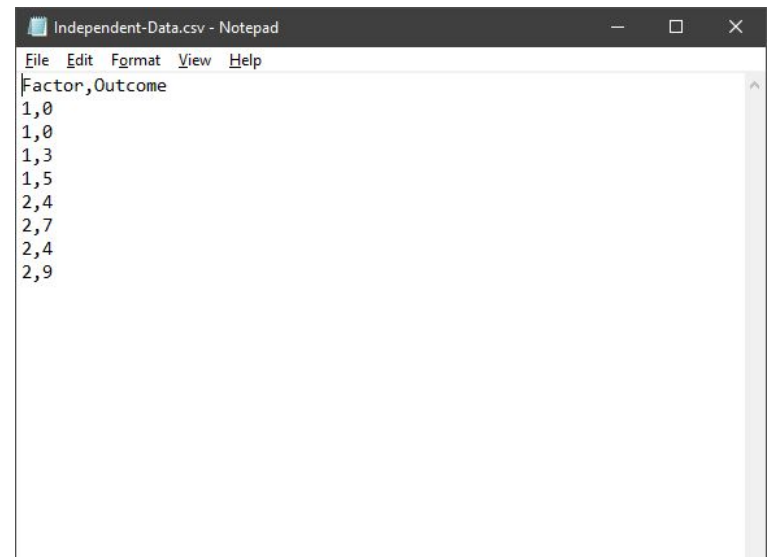


The screenshot shows a spreadsheet window titled 'Independent-Data.csv'. The data is entered as follows:

	A	B	C	D	E	F	G	H
1	Factor	Outcome						
2	1	0						
3	1	0						
4	1	3						
5	1	5						
6	2	4						
7	2	7						
8	2	4						
9	2	9						
10								
11								
12								
13								
14								
15								

## Steps for Entering Data (Using a Text Editor)

1. In the first row, type the names of the variables you wish to analyze (with names separated by commas). One variable will represent the Factor (Independent Variable) and the other will represent the Outcome (Dependent) Variable.
2. Enter the data for all of the participants. Notice that each participant has scores on both the Factor and Outcome Variables (with values separated by commas). There will be as many rows as people.
3. On the categorical Factor, use the group number as the value for the individual.
4. If your data set has more than two groups, simply be sure to add a group indicator and a score for each additional person.



The screenshot shows a text editor window titled 'Independent-Data.csv - Notepad'. The data is entered as follows:

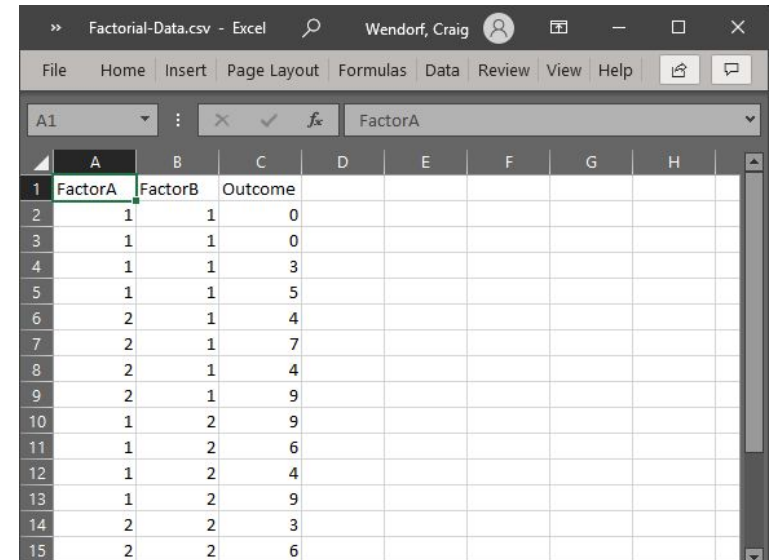
```
Factor,Outcome
1,0
1,0
1,3
1,5
2,4
2,7
2,4
2,9
```

**Your data are now ready to be analyzed!**

# Entering Factorial Data

## Steps for Entering Data (Using a Spreadsheet)

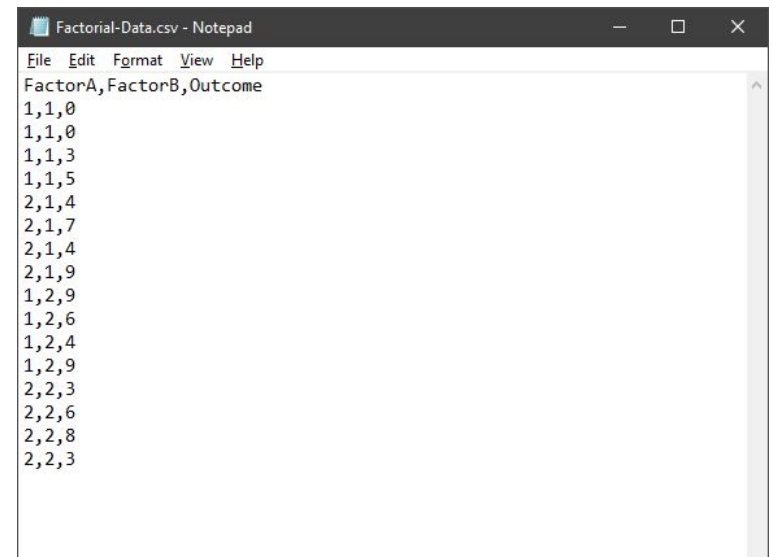
1. In the first row, type the names of the variables you wish to analyze. You should represent the Factors (Independent Variables) and the Outcome (Dependent) Variable.
2. Enter the scores for each of the same participants on the new variables. Notice that each individual (i.e., the rows) will still have values for each variable (i.e., the columns).
3. On the categorical Factors, note that the combination of values in the Factors will define the multiple groups of the factorial design.
4. When saving the file, be sure to save it as a CSV (comma delimited) file.



	A	B	C	D	E	F	G	H
1	FactorA	FactorB	Outcome					
2	1	1	0					
3	1	1	0					
4	1	1	3					
5	1	1	5					
6	2	1	4					
7	2	1	7					
8	2	1	4					
9	2	1	9					
10	1	2	9					
11	1	2	6					
12	1	2	4					
13	1	2	9					
14	2	2	3					
15	2	2	6					

## Steps for Entering Data (Using a Text Editor)

1. In the first row, type the names of the variables you wish to analyze. You should represent the Factors (Independent Variables) and the Outcome (Dependent) Variable.
2. Enter the scores for each of the same participants on the new variables. Notice that each individual (i.e., the rows) will still have values for each variable (i.e., the columns).
3. On the categorical Factors, note that the combination of values in the Factors will define the multiple groups of the factorial design.
4. When saving the file, be sure to save it as a CSV (comma delimited) file.



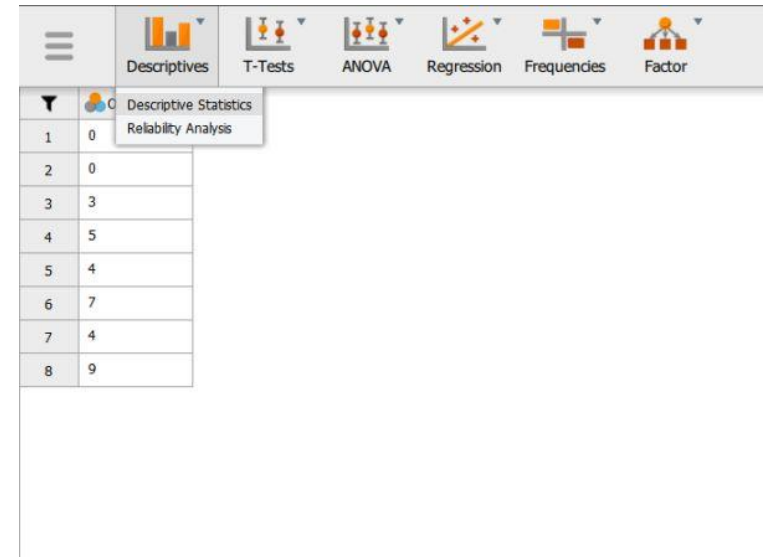
```
FactorA, FactorB, Outcome
1,1,0
1,1,0
1,1,3
1,1,5
2,1,4
2,1,7
2,1,4
2,1,9
1,2,9
1,2,6
1,2,4
1,2,9
2,2,3
2,2,6
2,2,8
2,2,3
```

**Your data are now ready to be analyzed!**

# Descriptives (Frequencies and Descriptive Statistics)

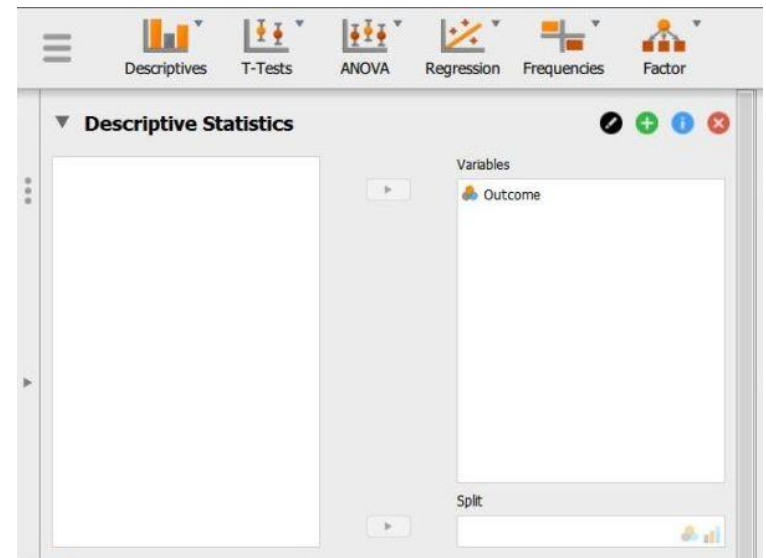
## Steps for Obtaining Frequency-Related Statistics

1. First, load the data file previously created (described elsewhere). Be sure that the data file looks as you intended.
2. On the “Common” statistics tab, select the “Descriptives → Descriptive Statistics” option.



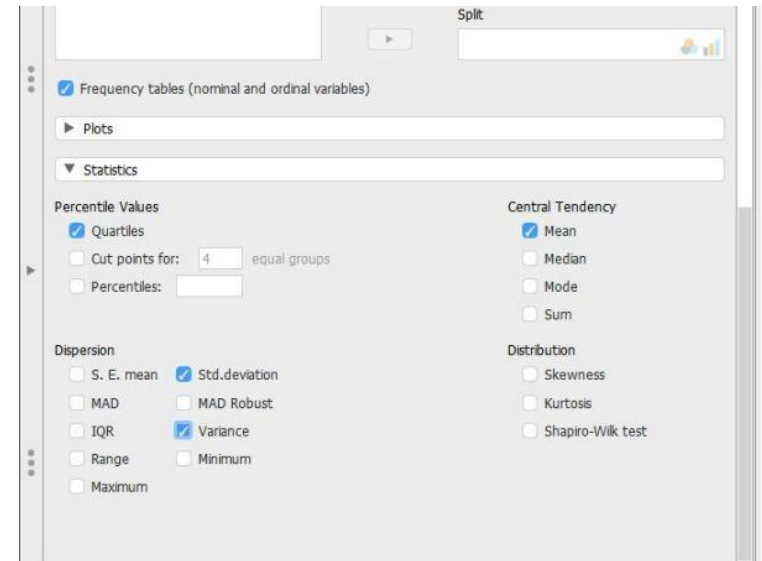
## Steps for Obtaining a Frequency Distribution

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.



### **Steps for Obtaining Summary 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.
9. Individual tables (or even the whole section of Output) can be copied using the drop-down arrow options in the output. These can be pasted into other word processing software for printing purposes.



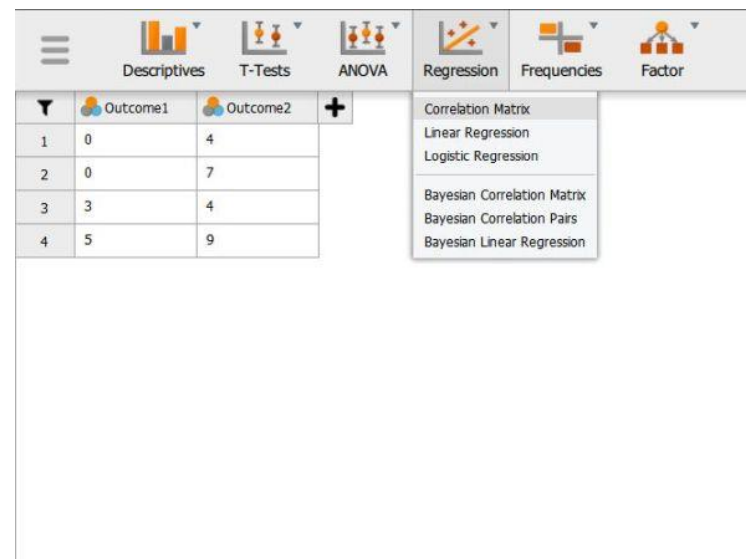
**Your data have now been analyzed!**



# Correlations (Bivariate)

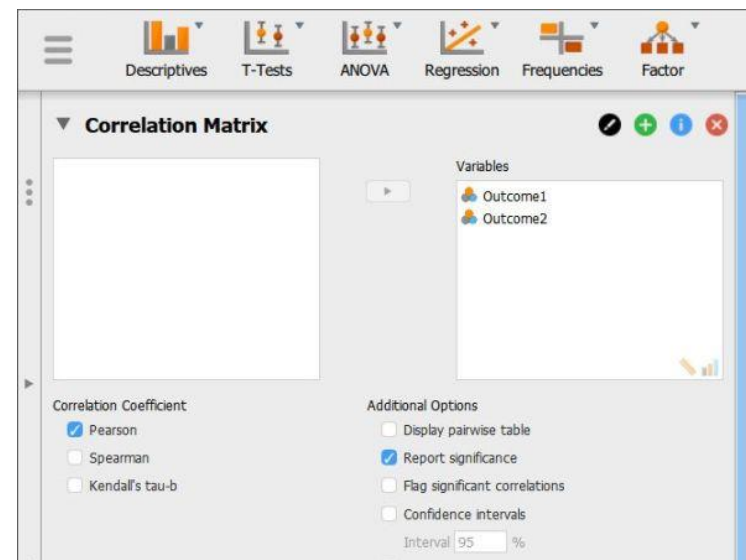
## Steps for Obtaining Correlational Statistics

1. First, load the data file containing multiple variables that you previously created (described elsewhere). Be sure that the data file looks as you intended.
2. Select the “Regression → Correlation Matrix” option from the “Common” statistics menu.



## Steps for Obtaining the Correlations (and Significance Tests)

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. Output can be copied and pasted into other documents for printing.
6. If you wish descriptive statistics associated with each variable, follow the “Descriptives” procedures described earlier in this manual.

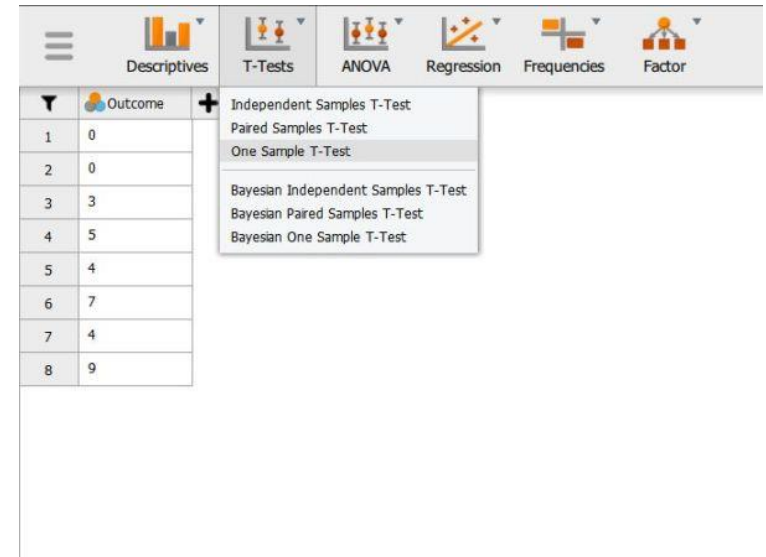


**Your data have now been analyzed!**

# T Test (One Sample)

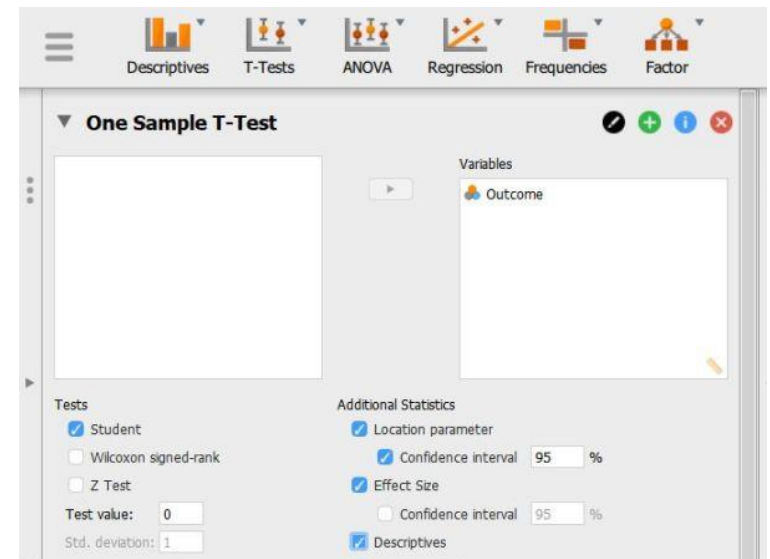
## Steps for Obtaining One-Sample Inferential Statistics

1. First, load the data file that you previously created (described elsewhere). Be sure that the data file looks as you intended.
2. Select the “T-Tests → One Sample T-Test” option from the “Common” statistics menu.



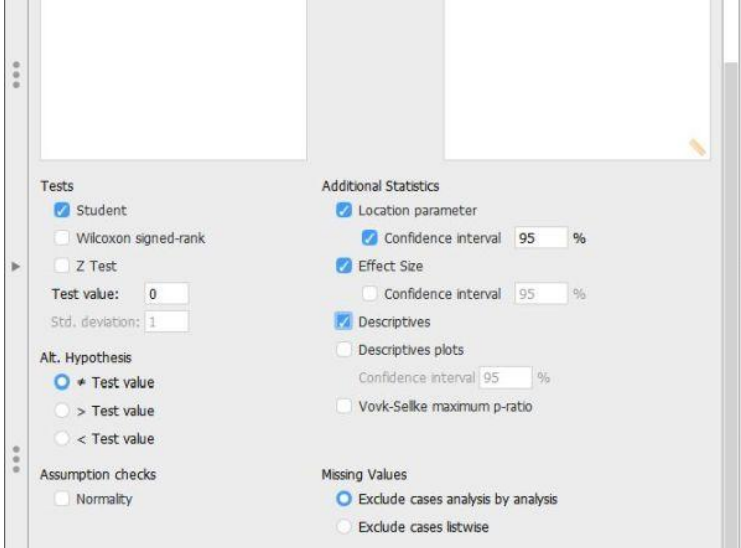
## Steps for Obtaining the Significance Test

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. Output can be copied and pasted into other documents for printing.



### **Steps for 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. Output can be copied and pasted into other documents for printing.



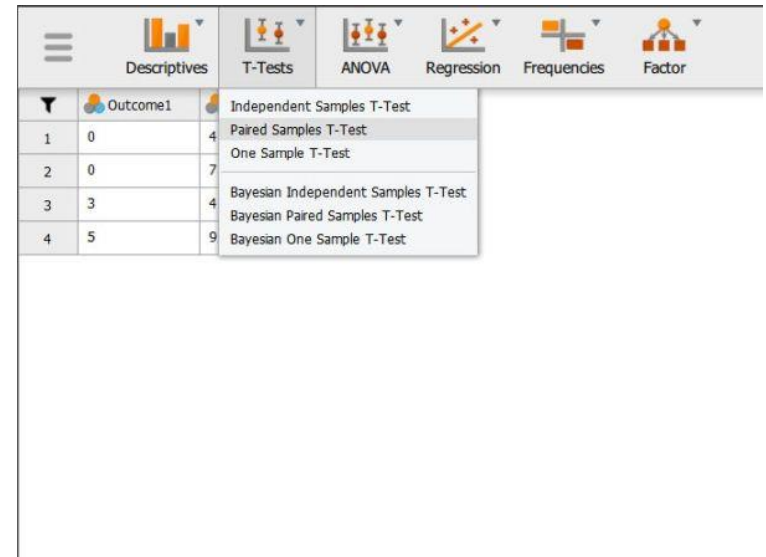
The image shows the 'Additional Statistics' dialog box in SPSS. The 'Tests' section on the left has 'Student' checked, with 'Test value' set to 0 and 'Std. deviation' set to 1. Under 'Alt. Hypothesis', '≠ Test value' is selected. The 'Assumption checks' section has 'Normality' unchecked. The 'Additional Statistics' section on the right has 'Location parameter' checked, with 'Confidence interval' set to 95%. 'Effect Size' is also checked, with its 'Confidence interval' set to 95%. 'Descriptives' is checked, with its 'Confidence interval' set to 95%. 'Descriptives plots' and 'Vovk-Selke maximum p-ratio' are unchecked. The 'Missing Values' section at the bottom has 'Exclude cases analysis by analysis' selected, with 'Exclude cases listwise' as an option.

**Your data have now been analyzed!**

# T Test (Paired Samples)

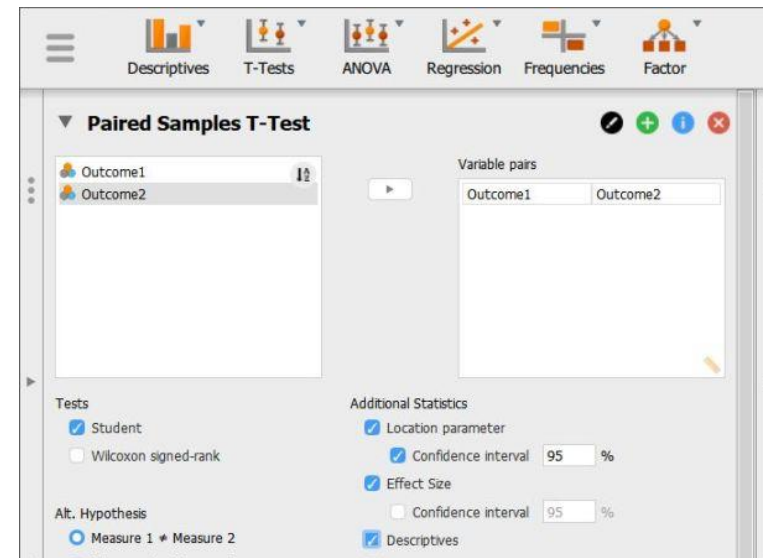
## Steps for Obtaining Paired-Sample Inferential Statistics

1. First, load the paired samples or repeated measures data file that you previously created (described elsewhere). Be sure that the data file looks as you intended.
2. Select the “T-Tests → Paired Samples T-Test” option from the “Common” statistics menu.



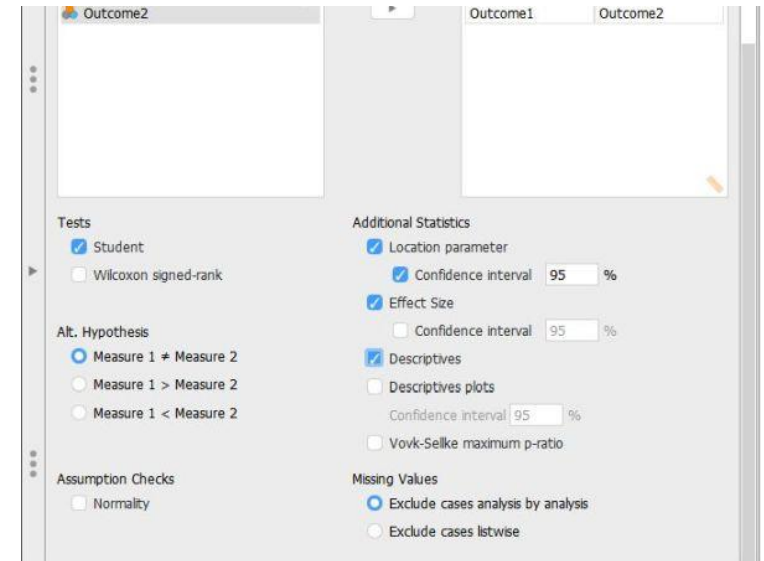
## Steps for Obtaining the Significance Test

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. Output can be copied and pasted into other documents for printing.



### **Steps for 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. Output can be copied and pasted into other documents for printing.

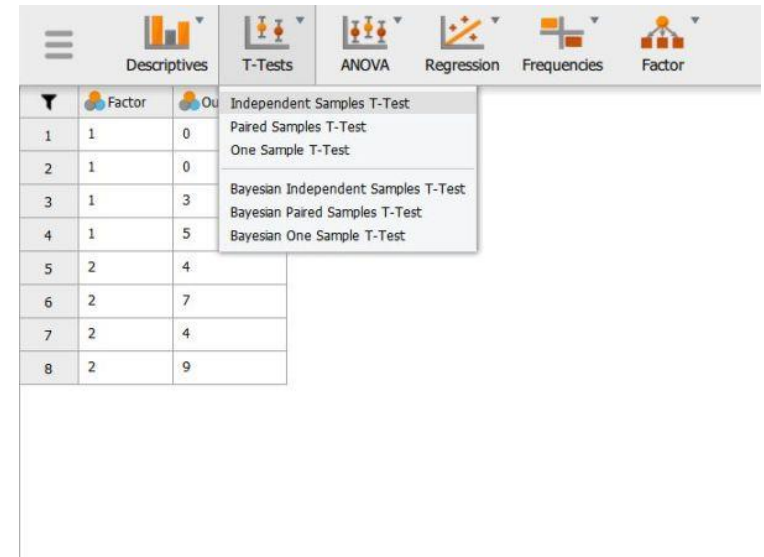


**Your data have now been analyzed!**

# T Test (Independent Samples)

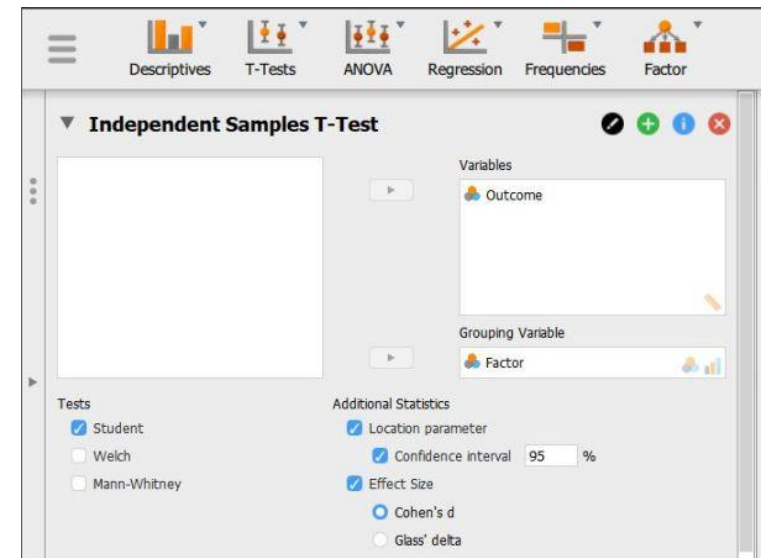
## Steps for Obtaining Two-Sample Inferential Statistics

1. First, load the two sample data file that you previously created (described elsewhere). Be sure that the data file looks as you intended.
2. Select the “T-Tests → Independent Samples T-Test” option from the “Common” statistics menu.



## Steps for Obtaining the Significance Test

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. Output can be copied and pasted into other documents for printing.



### **Steps for 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. Output can be copied and pasted into other documents for printing.

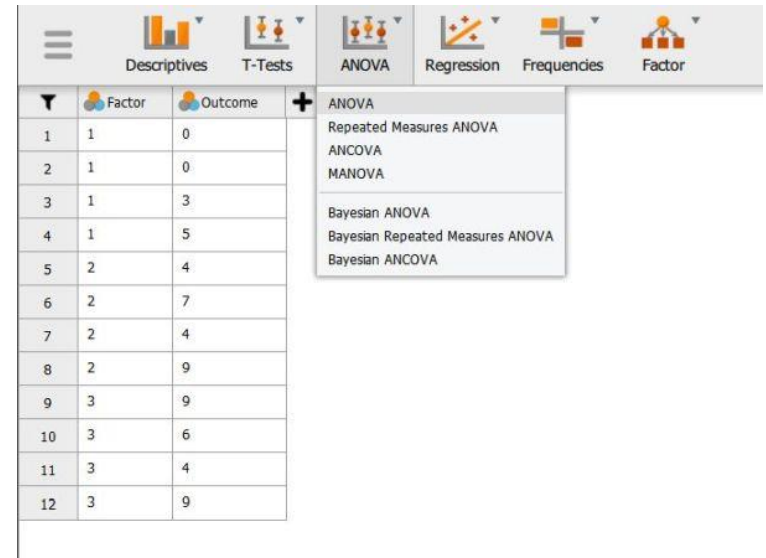
The screenshot shows the 'Additional Statistics' dialog box in SPSS. At the top, the 'Grouping Variable' is set to 'Factor'. The 'Tests' section on the left has 'Student' checked, while 'Welch' and 'Mann-Whitney' are unchecked. The 'Alt. Hypothesis' section has 'Group 1 ≠ Group 2' selected with a radio button, while 'Group 1 > Group 2' and 'Group 1 < Group 2' are unselected. The 'Assumption Checks' section has 'Normality' and 'Equality of variances' unchecked. The 'Additional Statistics' section on the right has 'Location parameter' checked, with 'Confidence interval' set to 95%. 'Effect Size' is checked, with 'Cohen's d' selected as the radio button option, while 'Glass' delta' and 'Hedges' g' are unselected. 'Descriptives' is checked, with 'Confidence interval' set to 95%. 'Descriptives plots' and 'Vovk-Sellke maximum p-ratio' are unchecked. The 'Missing Values' section has 'Exclude cases analysis by analysis' selected with a radio button, while 'Exclude cases listwise' is unselected.

**Your data have now been analyzed!**

# ANOVA (OneWay ANOVA)

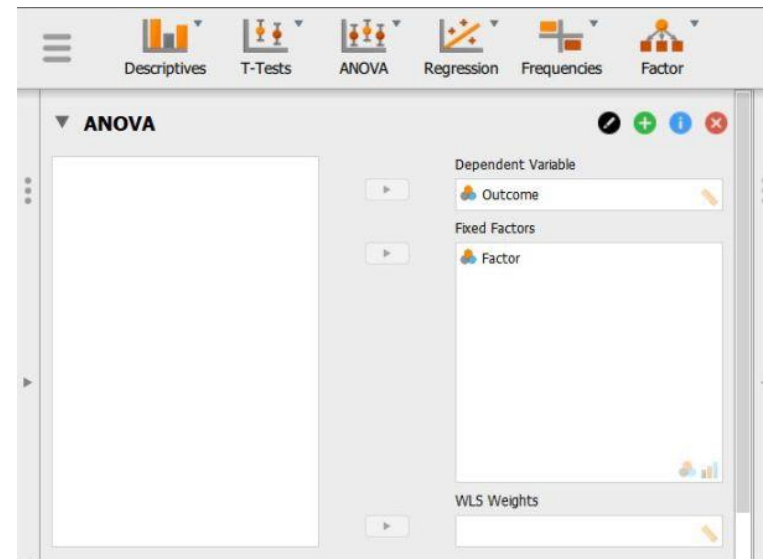
## Steps for Obtaining Multiple-Sample Inferential Statistics

1. First, load the two sample data file that you previously created (described elsewhere). Be sure that the data file looks as you intended.
2. Select the “ANOVA → ANOVA” option from the “Common” statistics menu.



## Steps for Obtaining the Significance Test

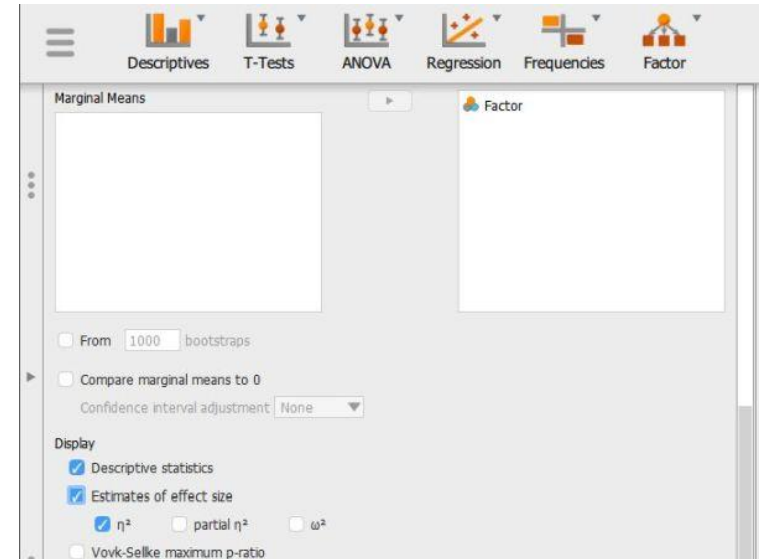
3. A set of options will then appear for you to choose the variables and statistics of interest.
4. Select the outcome variable and click the arrow to move it into the “Dependent Variable” box.
5. Move the Factor (Independent Variable) to the “Fixed Factors” box.
6. Output will automatically appear on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





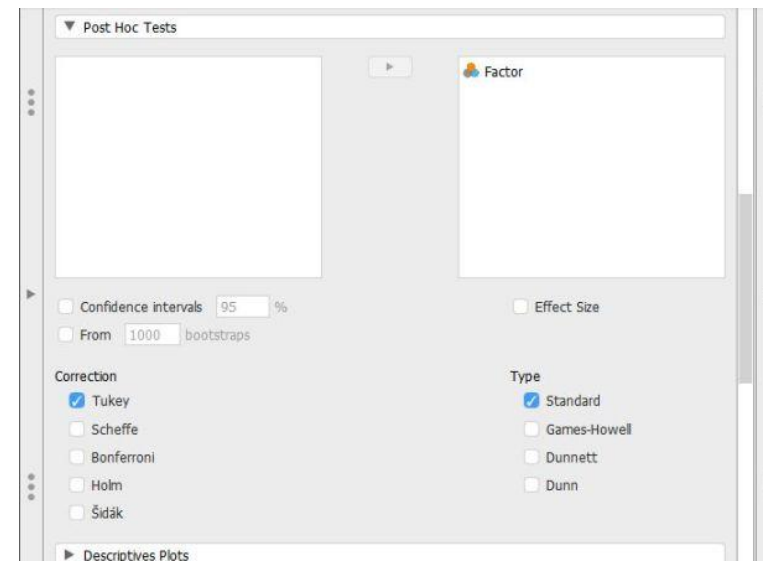
### Steps for Obtaining Additional Statistics

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. Output can be copied and pasted into other documents for printing.



### 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. Output can be copied and pasted into other documents for printing.

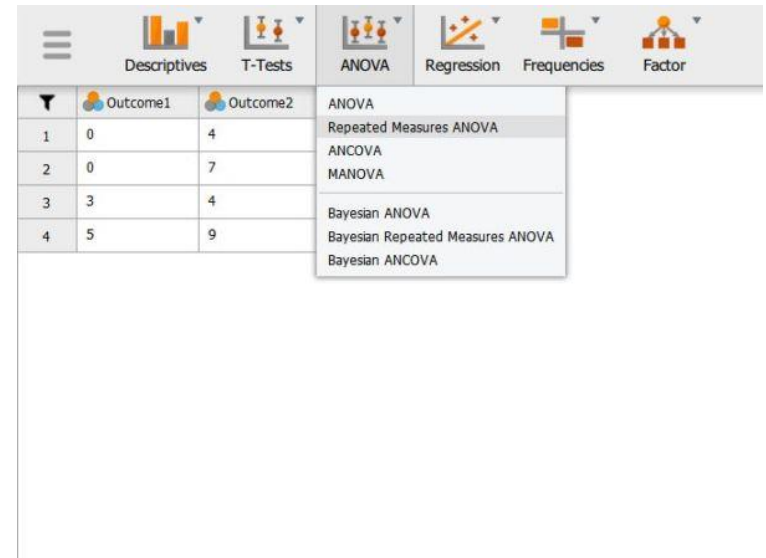


**Your data have now been analyzed!**

# Repeated Measures ANOVA

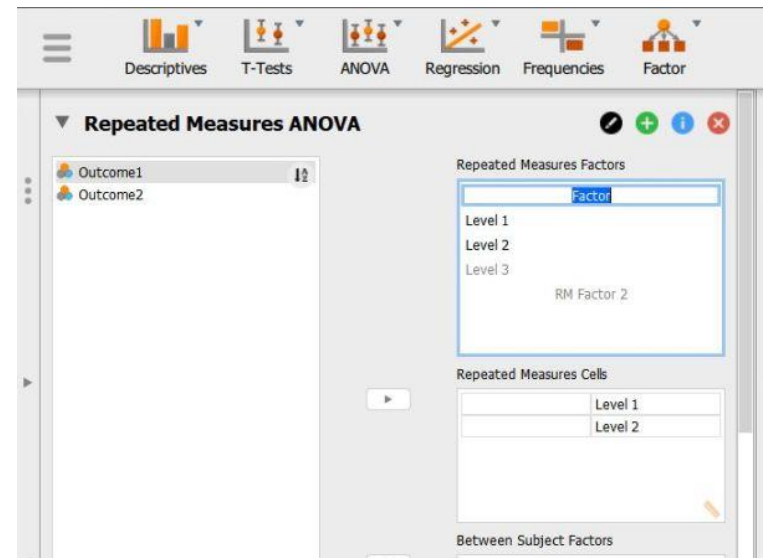
## Steps for Obtaining Repeated Measures Inferential Statistics

1. First, load the repeated measures data file that you previously created (described elsewhere). Be sure that the data file looks as you intended.
2. Select the “ANOVA → Repeated Measures ANOVA” option from the “Common” statistics menu.



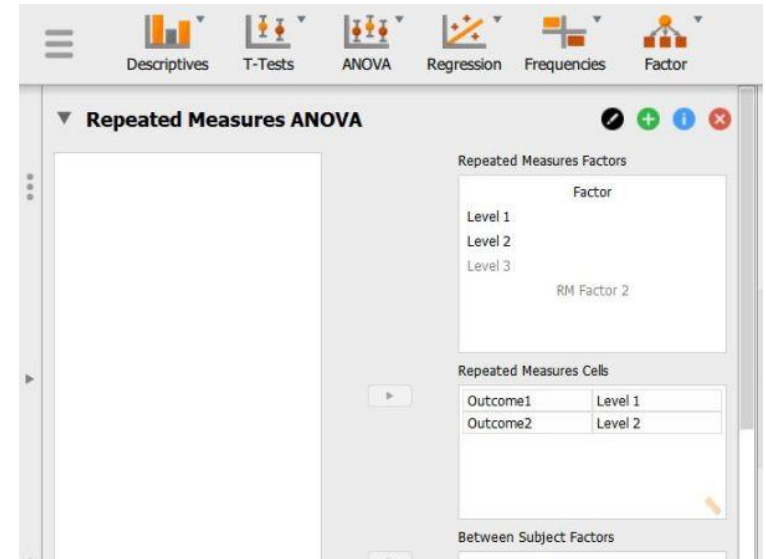
## Steps for Labeling the Within-Subjects Variable/Factor

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.



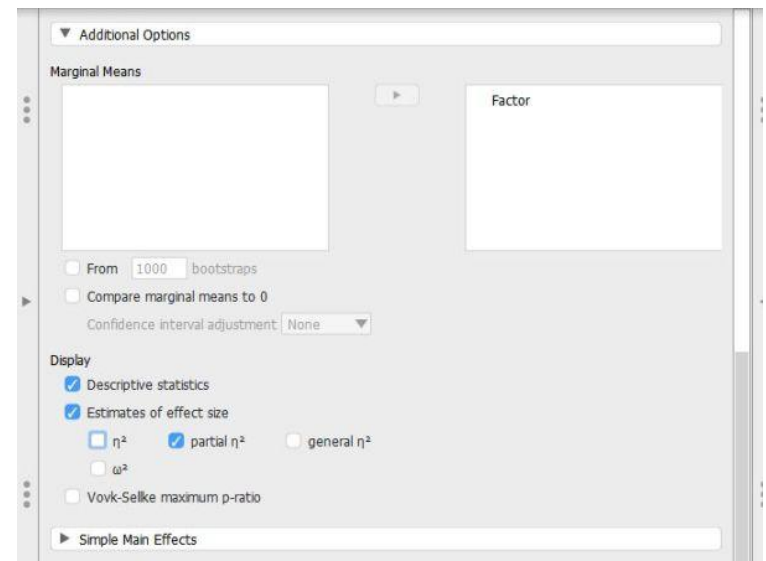
### Steps for Obtaining the Significance Test

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. Output can be copied and pasted into other documents for printing.



### Steps for 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. Output can be copied and pasted into other documents for printing.

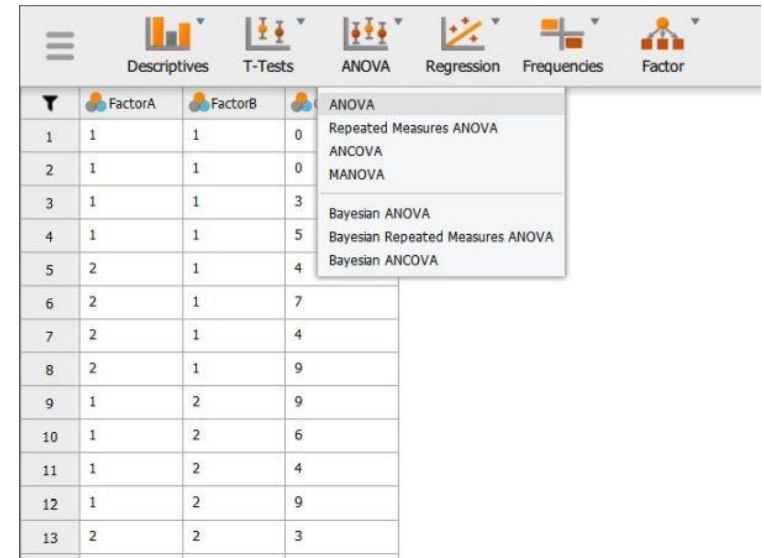


**Your data have now been analyzed!**

# ANOVA (Factorial ANOVA)

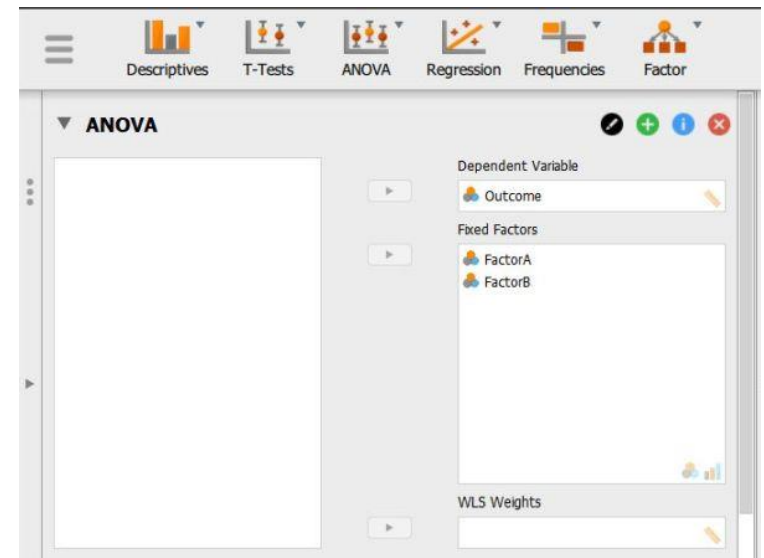
## Steps for Obtaining Factorial Inferential Statistics

1. First, load the factorial data file that you previously created (described elsewhere). Be sure that the data file looks as you intended.
2. Select the “ANOVA → ANOVA” option from the “Common” statistics menu.



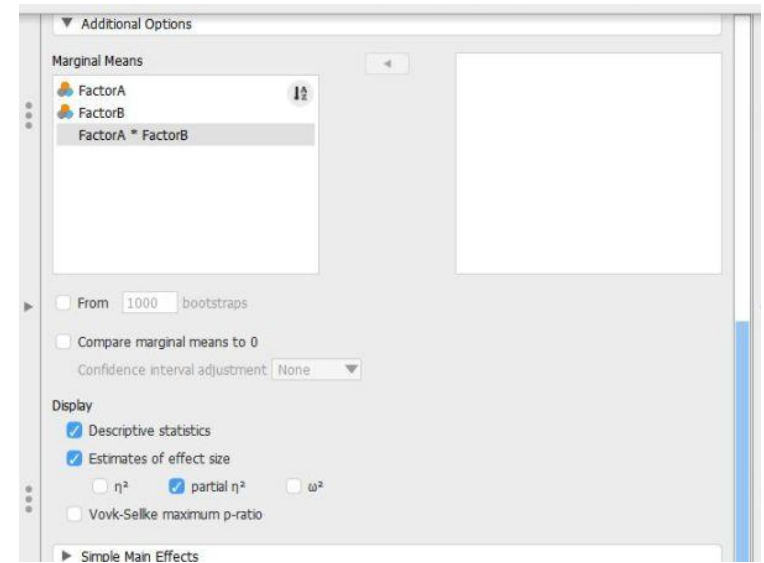
## Steps for Obtaining the Significance Test

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. Output can be copied and pasted into other documents for printing.



### **Steps for 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. Output can be copied and pasted into other documents for printing.



**Your data have now been analyzed!**