

SPSS20 HELP SHEET: Mann-Whitney U test

CONTENTS

1. How to enter data to do a Mann-Whitney U test.
2. How to do a Mann-Whitney U test.

1. How to enter data to do a Mann-Whitney U test.

For general advice on data entry see the “How to enter data into SPSS” help sheet.

Mann-Whitney U tests are used on unrelated data: Data for the dependent variable go in one column and data for the independent variable goes in another. In this example, the dependent variable is *BMD* and the independent variable is *SEX*. *BMD* is bone-density measurement measured in grams per square centimetre of the neck of the femur which is a scale level of measurement). *SEX* is measured at the nominal level: either 1 (value label = female) or 2 (value label = male).

Variable View

	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure	Role
1	BMD	Numeric	8	3	Bone Density ...	None	None	8	Right	Scale	Target
2	SEX	Numeric	8	0	Sex	{1, female}...	None	8	Right	Nominal	Input

Data View

(View – Value Labels off)

	BMD	SEX	var	var
1	.972	1		
2	.732	1		
3	.874	1		
4	.943	1		
5	1.024	1		
6	.755	1		
7	.779	1		
8	1.007	1		
9	.816	1		

Data View

(View – Value Labels on)

	BMD	SEX	var	var
1	.972	female		
2	.732	female		
3	.874	female		
4	.943	female		
5	1.024	female		
6	.755	female		
7	.779	female		
8	1.007	female		
9	.816	female		

2. How to do a Mann-Whitney U test.

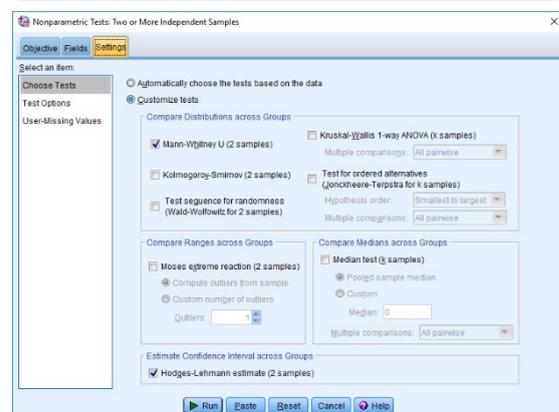
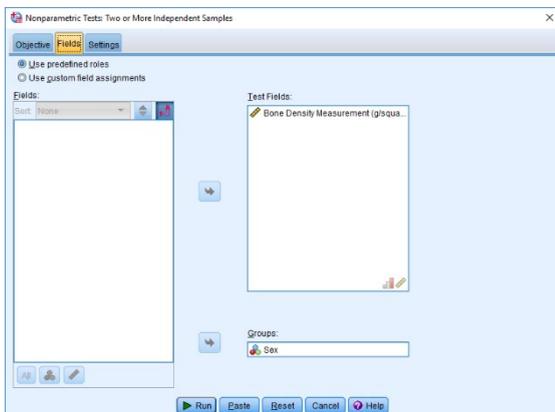
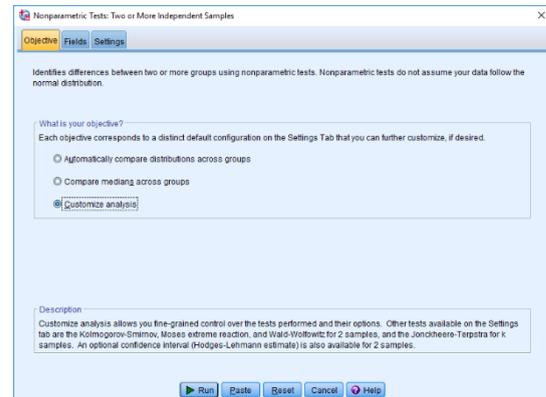
To get SPSS to conduct a Mann-Whitney U test :

Open your data file.

Select: Analyze - Nonparametric Tests – Independent Samples...

This will bring up the **Nonparametric Tests Two or More Independent Samples Tests** window which has three tabs:

1. **Objective.** Select **Customize analysis.**
2. **Fields.** Either use the default **Use predefined roles** or select **Use custom field assignments** and send *Bone Density Measurement* to the **Test Field** box and *Sex* to the **Groups** box.)
3. **Settings.** Select **Customize tests**, then **Mann-Whitney U (2 samples)** in the **Compare distributions across Groups** area and **Hodges-Lehman estimates (2 samples)** under in the **Estimate Confidence Interval across Groups**



Press **Run** on any and then double click on the **Hypothesis Test Summary** table in the **Output** window to bring up the **Model Viewer** window. From the **View** drop-down menu (bottom left), select **Confidence Interval Summary View**. This will produce the following in the **Output** window.

Confidence Interval Summary

Confidence Interval Type	Parameter	Estimate	95% Confidence Interval	
			Lower	Upper
Independent-Samples Hodges-Lehman Difference	Difference between medians of Bone Density Measurement (g/square cm) across categories of Sex	-.071	-.130	-.005

Independent-Samples Mann-Whitney U Test

Total N	40
Mann-Whitney U	279.500
Wilcoxon W	489.500
Test Statistic	279.500
Standard Error	36.955
Standardized Test Statistic	2.151
Asymptotic Sig. (2-sided test)	.032
Exact Sig. (2-sided test)	.030

NB: Using this route, the U value that SPSS reports is the one associated with the sum of ranks for the second variable on the list so it depends on the order as to whether it's the higher or lower value.

In summary the key information from the test is

$$U_{\text{higher}}=279.5, n_1=20, n_2=20, P=0.032;$$

And the unstandardized effect size (estimated difference between the medians of the populations) is difference (female–male)=-0.071, 95% CI [-0.130,-0.005]