

## SPSS20 HELP SHEET: Mann-Whitney U test

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#### 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.

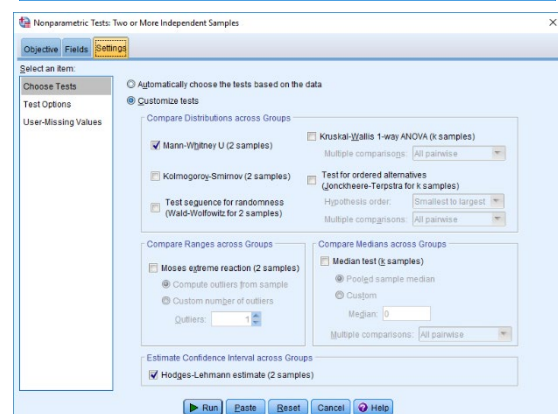
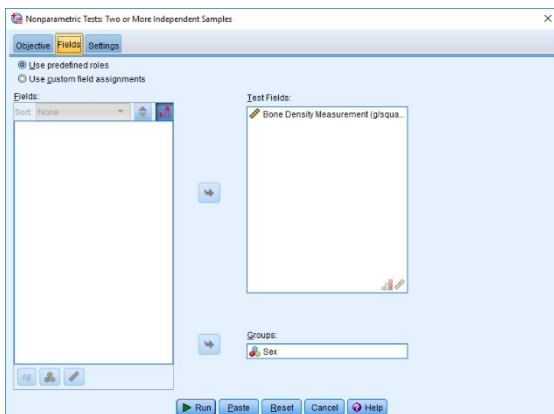
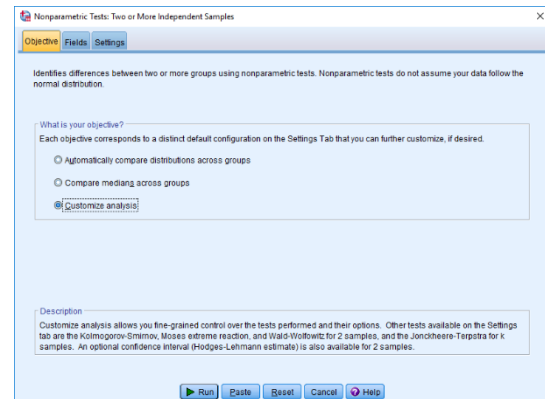
To get SPSS to conduct a Mann-Whitney U test :

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

**Statistics**

Statistic	Sample 1 (n1)	Sample 2 (n2)
Mean Rank	16.52	24.48

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]