

SPSS Instructions for Mann Whitney U test

This example uses material from the STARS project (www.stars.ac.uk)

The data file for this example is *upgrade4.sav*. Recent graduates interviewed for the 2004 Barclays Annual Graduate Survey answered questions about their experience of employment and personal finance one or two years after graduation. The data file has a selection of these results. You need to download and save this file for use in the example.

Open SPSS and the data file

On the Brookes PC network, select Start > All programs > Statistics > SPSS, choosing version 15.0.

If necessary, when SPSS has loaded, click Cancel to avoid a tutorial session.

To open the data file, *upgrade4.sav*, select File > Open and then navigate to the folder where you have downloaded and saved the file for this example and open the data file.

The data file contains just two of the variables recorded in the survey:

Stloandebt Amount owed to Student Loans Company (£, numeric)

Subtype Type of subject studied
(1 = Arts, social studies, languages; 2 = Sciences; 3 = Business; 4 = Other)

Carry out a Mann-Whitney U test

- Select **Analyse > Nonparametric tests > 2 Independent Samples**
- Select *Stloandebt* for the box labelled **Test Variable List** and *Subtype* for the box labelled **Grouping Variable**
- Click on **Define Groups**, type in a 2 into the **Group 1** box and a 3 into the **Group 2** box
- Select **Continue > OK**

SPSS generates two tables, shown below. Check that your output is the same.

NPar Tests

Mann-Whitney Test

Ranks

| | Type of subject studied | N | Mean Rank | Sum of Ranks |
|--------------------------------------|-----------------------------|-----|-----------|--------------|
| Amount owed to Student Loans Company | Sciences | 500 | 406.86 | 203429.50 |
| | Business and administration | 311 | 404.62 | 125836.50 |
| | Total | 811 | | |

Test Statistics^a

| | Amount owed to Student Loans Company |
|------------------------|--------------------------------------|
| Mann-Whitney U | 77320.500 |
| Wilcoxon W | 125836.500 |
| Z | -.136 |
| Asymp. Sig. (2-tailed) | .892 |

a. Grouping Variable: Type of subject studied

Can you use the output to answer the following questions?

First look at the tables

- 1 What are the hypotheses for the Mann-Whitney U test ?
- 2 What do you conclude?
- 3 The size of the graduates' debts to the Student Loan Company are quantitative data, why do you think that a non-parametric test was used?

Answers

- 1 Null: median student loan debt is the same for both science and business graduates
Alternative: median student loan debt differs between science and business graduates.
- 2 As $P > 0.05$, conclude that the data does not provide statistically significant evidence of a difference between science and business graduates in median debts to the Student Loan Company. (Mann Whitney U, $z = -0.136$, $P = 0.892$)
- 3 A non-parametric test would be needed if the data did not support the assumptions underlying a parametric test (in this case, the two-sample t-test). This is the case here, since the distribution of student debt has a highly skewed distribution, with a discontinuity produced by a high concentration of graduates with no student loan debts.