## *Mann-Whitney U Test*

An alternative to the Student t-test when the scale of measurement cannot be assumed to be interval or ratio and the distribution of errors is unknown is a non-parametric test known as the Mann-Whitney test. In this test, the dependent variable scores for both groups are ranked and the number of times that one groups scores exceed the rank of scores in the other group are recorded. This total number of times scores in one group exceed those of the other is named U. The sampling distribution of U is known and forms the basis for the hypothesis that the scores come from the same population.
The example below illustrates the calculation of the U test with LazStats using the mannwhitU.LAZ file:

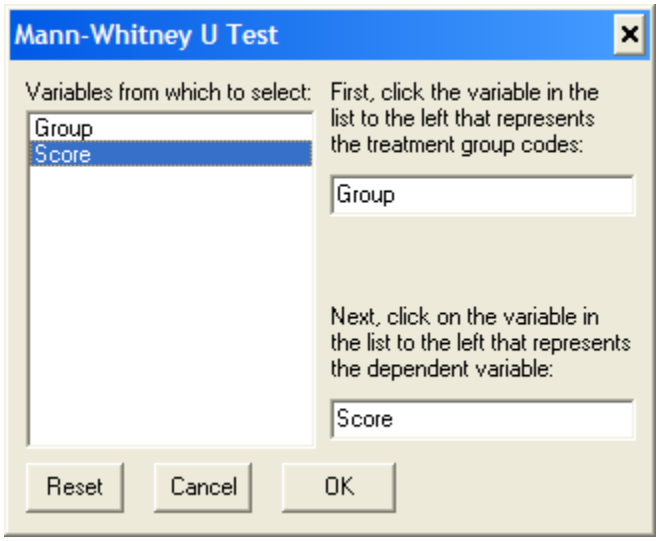


**Figure 1. The Mann-Whitney U Test Form**

```
Mann-Whitney U Test
See pages 116-127 in S. Siegel's Nonparametric Statistics for the
Behavioral Sciences

      Score      Rank      Group

       6.00       1.50          1
       6.00       1.50          2
       7.00       5.00          1
       7.00       5.00          1
       7.00       5.00          1
       7.00       5.00          1
       7.00       5.00          1
       8.00       9.50          1
       8.00       9.50          2
       8.00       9.50          2
       8.00       9.50          1
       9.00      12.00          1
      10.00      16.00          1
      10.00      16.00          2
      10.00      16.00          2
      10.00      16.00          2
      10.00      16.00          1
      10.00      16.00          1
      10.00      16.00          1
      11.00      20.50          2
```

| | | |
|---|---|---|
| 11.00 | 20.50 | 2 |
| 12.00 | 24.50 | 2 |
| 12.00 | 24.50 | 2 |
| 12.00 | 24.50 | 2 |
| 12.00 | 24.50 | 2 |
| 12.00 | 24.50 | 1 |
| 12.00 | 24.50 | 1 |
| 13.00 | 29.50 | 1 |
| 13.00 | 29.50 | 2 |
| 13.00 | 29.50 | 2 |
| 13.00 | 29.50 | 2 |
| 14.00 | 33.00 | 2 |
| 14.00 | 33.00 | 2 |
| 14.00 | 33.00 | 2 |
| 15.00 | 36.00 | 2 |
| 15.00 | 36.00 | 2 |
| 15.00 | 36.00 | 2 |
| 16.00 | 38.00 | 2 |
| 17.00 | 39.00 | 2 |

Sum of Ranks in each Group

| Group | Sum | No. in Group |
|---|---|---|
| 1 | 200.00 | 16 |
| 2 | 580.00 | 23 |

No. of tied rank groups = 9
Statistic U = 304.0000
z Statistic (corrected for ties) = 3.4262, Prob. > z = 0.0003