Activity 5.1: The Kruskal-Wallis Nonparametric Test

This activity uses the dataset **TeachingMethod.sav** that is included in the Activity folder for this section.

Three teaching methods were tested on a group of 19 students with homogeneous backgrounds in statistics and comparable aptitudes. Each student was randomly assigned to a method and at the end of a 6-week program was given a standardized exam. Because of classroom space and group size, the students were not equally allocated to each method. The results are shown in the table below. Test for a difference in distributions (medians) of the test scores for the different teaching methods using the Kruskal-Wallis test.

The three variables of the dataset are

Method1

Method2

Method3

INSTRUCTIONS

1. You are going to create two new variables. In Variable View, in Name column cell 4, type in a new variable **CombMeth** (for Combined Methods), a categorical variable (nominal) with the codes (1 for Method 1, 2 for Method 2, 3 for Method 3). In name column cell 5, type in the variable **TestScores**, a scale variable with no decimal places.
2. Now in Data View, under the CombMeth variable column, type 1 in cells 1 to 9, then 2 in cells 10 to cell 21, then 3 in cells 22 to 31. Enter the scores for all method 1s under the TestScores variable from cells 1 to 9, the scores for method 2 from cells 10 to 21, and the scores for method 3 in cells 22 to 31.
3. Now it is time to check the assumption of same shape for the treatment distributions. Select **Graphs → Chart Builder,** and create a simple box plot with **CombMeth** on the x-axis and TestScores as the dependent variable. You may double-click the resulting boxplot to access the chart editor and adjust any display settings as desired (background color, bar width, bar color, etc.). As long as the boxes have approximately the same shape, you may continue with the Kruskal-Wallis procedure.

4. Select **Analyze** **Nonparametric Tests** **K Independent Samples**… (see upper-left figure, below). Select "TestScores" as the test variable, select "CombMeth" as the grouping factor, and select "Kruskal-Wallis H" as the test type (see upper-right figure, below). Click "Define Range…" and enter the minimum value (1) as well as the maximum value (3) (see lower-left figure, below). Click "Continue" to close the range definitions and then click "OK".

★ Please create a copy of the Excel file and use the duplicate to complete the activity. Ensure no changes are made to the shared file