# **Mann-Whitney U Test**

* The Mann-Whitney U test is the non-parametric alternative test to the independent sample t-test.
* It is a non-parametric test that is used to compare two sample means that come from the same population, and used to test whether two sample means are equal or not.
* Usually, the Mann-Whitney U test is used when the data is ordinal or when the assumptions of the t-test are not met.

# **Kruskal Wallis H test**

* The Kruskal-Wallis test is a nonparametric test, and is used when the assumptions of one-way ANOVA are not met.
* Both the Kruskal-Wallis test and one-way ANOVA assess for significant differences on a continuous dependent variable by a categorical independent variable (with two or more groups).
* The Kruskal-Wallis test can be used for both continuous and ordinal-level dependent variables.

#### Null Hypothesis and Alternative Hypothesis

* Null hypothesis: Null hypothesis assumes that the samples (groups) are from identical populations.
* Alternative hypothesis: Alternative hypothesis assumes that at least one of the samples (groups) comes from a different population than the others.

# **Findings**

* Gender affects Training Hours per Week
* Experience impacts Quality of Life; Empowerment; and Family Peer Influence
* Sports type affects Quality of Life;
* Education affects Self Esteem; and Empowerment
* Socioeconomic Status affects Quality of Life; and Body Image and Autonomy

# **Chi-Square test of independence**

* The Chi-Square test of independence is used to determine if there is a significant relationship between two nominal (categorical) variables.
* The frequency of each category for one nominal variable is compared across the categories of the second nominal variable.
* The data can be displayed in a contingency table where each row represents a category for one variable and each column represents a category for the other variable.

#### Null Hypothesis and Alternate Hypothesis:

* Null hypothesis: Assumes that there is no association between the two variables.
* Alternative hypothesis: Assumes that there is an association between the two variables.

#### Disadvantage:

We have too small data, and we need a non-parametric test for robust results

# **Findings:**

* Because of the small size of the data, the test could not detect any association
* However, it could detect an association between Sports and Social Inclusion

# **Spearman Rank correlation**

* The Spearman correlation is a nonparametric measure of the monotonicity of the relationship between two datasets.
* Unlike the Pearson correlation, the Spearman correlation does not assume that both datasets are normally distributed.
* Like other correlation coefficients, this one varies between -1 and +1 with 0 implying no correlation.

# **Kendall's Tau**

* Kendall’s tau is a measure of the correspondence between two rankings.

#### Null Hypothesis and Alternate Hypothesis:

* Null hypothesis: Assumes that there is no association between the two variables.
* Alternative hypothesis: Assumes that there is an association between the two variables.[¶](https://nbviewer.jupyter.org/github/BhaskarBiswas/Python-Codes/blob/master/Disability_and_Sports/Statistical_Tests.ipynb#Alternative-hypothesis:-Assumes-that-there-is-an-association-between-the-two-variables.)

# **Findings:**

* Neither Spearman Rank correlation nor Kendall's Tau measure could find any association between Training Hours per Week and the dependent variables;
* They could not detect any association between Disability percentage and the dependent variables as well.
* However, they could find a relationship between the following
  + *Education and Empowerment;*
  + *Sports and Quality of Life;*
  + *CompSports Experience and Quality of Life*
  + Socioeconomic\_Status and BodyImage\_Autonomy[¶](https://nbviewer.jupyter.org/github/BhaskarBiswas/Python-Codes/blob/master/Disability_and_Sports/Statistical_Tests.ipynb#--%3E-Socioeconomic_Status-and--BodyImage_Autonomy)