THE USE OF INFERENTIAL ANALYSIS

We need to know when it is appropriate to use four different kinds of statistical test. These are called **Spearman's rho**, the **Mann Whitney test**, the **Wilcoxon test**, and **Chi-Squared**. The Unit 4 examination will include stimulus material describing a hypothetical study. One of the questions you will be asked is: "Name a test that would be appropriate to analyse the data in this study." Alternatively, you may be asked: "Explain why this test was used."

This is how to select the appropriate test:

- If the stimulus material describes a study looking at the *relationship* between two variables (i.e. a *correlational study*), the test to use is **Spearman's rho**.

- If the stimulus material describes a study looking for a *difference* between two conditions, has used an *independent groups design*, and the participants have obtained *some kind of score*, the test to use is the **Mann-Whitney**.

- If the stimulus material describes a study looking for a *difference* between two conditions, has used a *repeated measures design* or a *matched pairs design*, and the participants have obtained *some kind of score*, the test to use is the **Wilcoxon**.

- If the stimulus material describes a study looking for a *difference* between two conditions, has used an *independent groups design*, and *categories* have been used, the test to use is **Chi-Squared**.

When we use statistical tests, we always calculate a test statistic. This is sometimes called the **calculated value** or **obtained value**. To see if a difference or correlation is significant, we compared this value with the relevant value that appears in the table that accompanies each statistical test. This is called the **tabled value**.

- For an outcome of a statistical test to be significant when **Spearman's rho** or **Chi-Squared** has been used, the calculated value needs to be **bigger** than the tabled value.

- For an outcome of a statistical test to be significant when the **Wilcoxon test** or the **Mann-Whitney test** has been used, the calculated value needs to be **smaller** than the tabled value.

You might be provided with a calculated value of one of the tests, and be asked to decide whether or not a difference or correlation is statistically significant. This sounds like it might be a very difficult thing to do. However, it is actually very simple, since you will almost certainly be given the information about whether a calculated value needs to be bigger or smaller than the tabled value. But, you will still need to be able to find the correct tabled value. This is the way to do it:

- Decide whether the experimental hypothesis is **directional** (also called **one-tailed**) or **non-directional** (also called **two-tailed**)
- Go to the appropriate column headed **0.05** (remember, it is conventional to use the 5% significance level to see if a difference or correlation is statistically significant)
- Go to the appropriate **N** in the case of **Spearman's rho** *and* the **Wilcoxon test**, the appropriate **Na** and **Nb** in the case of the **Mann-Whitney test**, or the appropriate **df** in the **Chi-Squared test**.
- Make your decision based on whether the calculated value is bigger or smaller than the tabled value