

Title: Which test to Use

Target: On completion of this worksheet you should be able to identify key assumptions and conduct the appropriate test based on the type of data

To Start:

Firstly we consider what type our Dependent (outcome) variable data is. This could be Scale or Nominal.

Scale variable is a set of data where the data is random usually within a range such as Height where we would measure in cm.

Nominal variable is a set of data that is more of a tally such as asking someone for gender or yes or no to a question where it would be a tally than individual input.

What to do after classifying dependent variable

Once we have classified our dependent variable we need to look at our independent variable/predictor.

Scale: We need to see if there is one or more predictors. If its one we consider 3 types of predictor, but if its 2 or more we only consider 2 types.

Nominal: There should be only one predictor for this type of outcome. We now need to consider what type of predictor we have.

Scale: One predictor

Since we have a scale outcome, we need to look at the predictor. For the one predictor we need to consider if its Scale or Nominal. If it is a scale predictor then it will only have two possible tests to conduct, whereas if its Nominal, we need to see how many groups there are. 2 groups would be regarded as something like "yes" or "no", while more than 2 groups could be colour of a car which could give "black" "white" "red" etc.

Predictor is Scale

We would now consider if our assumptions for analysis has been met or if our data is normally distributed (a symmetric bell shape graph). If the assumption has been met or our data is normally distributed we would do **Pearson correlation or regression, ST2 S12**. If the assumption has not been met or the data doesn't look normally distributed then we would use **Spearman Correlation or regression, ST2 S12**

Predictor is Nominal

Predictor is 2 groups: We would check if the groups are paired. This is where they have the same amount of data recorded and have a relation. Once we have distinguished this, we now check if the assumptions have been met. For paired assumptions, i.e. A group of students performed two similar test with different conditions, we use **Paired samples t-test, ST3**, if paired but no assumption (the data doesn't represent a normally distribution) we use **Wilcoxon signed rank test**. If they are not paired but assumption has been met, i.e. two groups performed the same test but both under different conditions, we use **Independent samples t-test, S16** if not sampled nor assumptions met use **Mann-Whitney, S20**.

Predictor is More than 2 groups: We look whether their assumptions have been met. If yes use **One-way ANOVA, ST7**, if no use **Kruskal-Wallis test, S21**

2 or more predictors

We need to look at our types of predictors. They could either be Scale or Nominal.

Scale: If the type of predictors are scale, we would use **Multiple regression, S12**

Nominal: If the type of predictors are Nominal, we would use **Factorial ANOVA**

Nominal: One predictor

We have one predictor, now we need to see what type of predictor we have.

Scale: If our predictor type is Scale then we would use **Logistic regression**

Nominal: If our predictor type is Nominal, we make sure the entities are not the same, then we perform **Chi-squared test, S17**. If it is the same entities then something has gone wrong within your data/experiment.

Further Help

The Maths Support Centre has a booklet called **An Introduction to SPSS 24** which has the diagram and further help on the tests if the sheets outlined cannot help you or not understand what its saying.