

# Basic Statistical Tests

## *Numeric Data – Measurements*

### **One Sample T Test**

There is only one set of numbers, not grouped in any way, and we are comparing the mean of those numbers to a specific value.

### **Two Sample T Test – Independent Samples**

There is one set of measurements, but we are splitting the data into two groups. We are comparing the means of the groups to each other.

### **Paired Samples T Test – Dependent Samples**

There is only one group, but with two measurements for each item. We are comparing the measurements to each other to see if they are equal.

### **One-Way ANOVA**

This is an extension of the two sample T test. There is still one measurement, but now we are comparing the means of three or more groups with each other.

### **Two-Way ANOVA**

This is like the one-way ANOVA except that items are classified by two grouping variables and arranged into table form with rows and columns. We are comparing the means of each grouping variable as well as whether there is any interaction between the variables.

### **Correlation & Regression**

Both of these use paired data. While the paired samples t test checks to see if the two values are equal, these check to see if they are related. **Correlation** measures the strength of a linear relationship while **Regression** describes the linear relationship by finding the equation of the line.

## *Categorical Data – Counts, Percents*

### **One Proportion Test**

There is only one set of responses with only two possible outcomes for each response. We are comparing our sample proportion to a specific proportion.

### **Two Proportion Test**

The responses can only have two possible outcomes but they are separated into two groups. We're comparing the proportion of the two groups to each other.

### **Chi-Square Goodness of Fit Test**

This is an extension of the one proportion test. Instead of only having two possible outcomes, use this when there are more than two outcomes. You may either have specific proportions for each outcome or you can say all the outcomes occur equally.

### **Chi-Square Test for Independence – Cross Tabulation**

This is an extension of the two proportion test. Use this when you have more than 2 groups or more than 2 possible outcomes.