# Parametric Statistics

## Week 6 - Statistical Assumptions

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Munich, 27. November 2019

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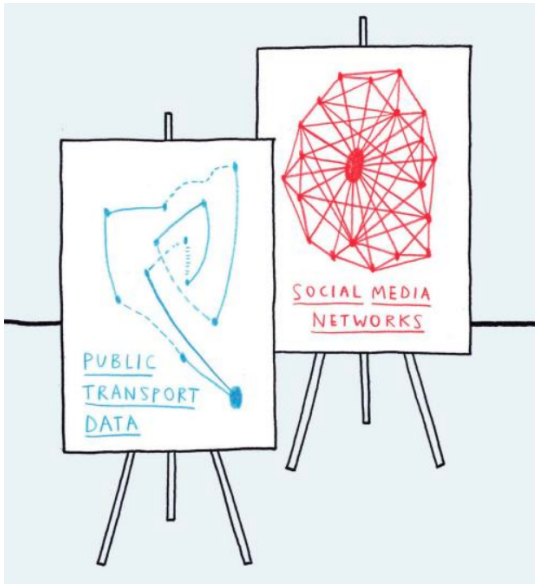


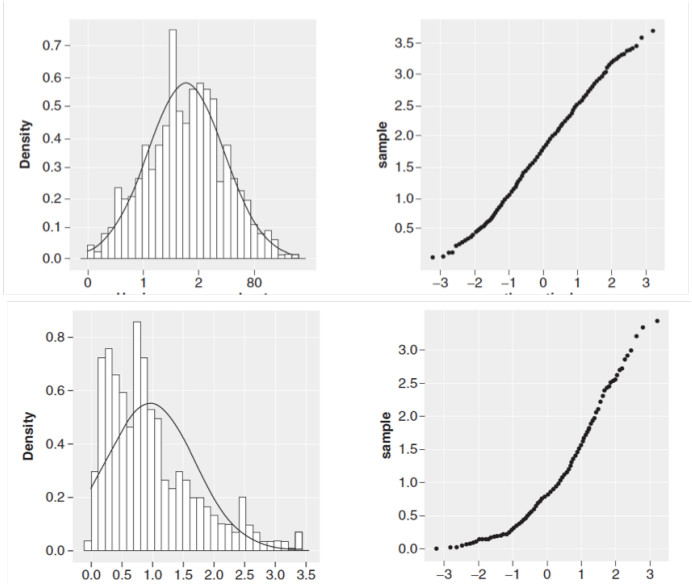
## Significance Tests

Types of significance tests:

- Comparing means
- Asses correlation
- **Check assumptions**

## Assumption of Normality

The first way to check for normality is to visualize a **Q-Q plot**. It is a cumulative distribution when the data are sorted. Normality is a straight diagonal line.



## Assumption of Normality

The second way is to check the skewness and kurtosis values.

A normal distribution have zero values. The further the values are from zero, the more likely it is that the data are not normally distributed

There is a another way...statistical tests!

## Shapiro-Wilk test

*H0* : The distribution of the sample is normally distributed
*H1* : The distribution of the sample is significantly different from a normal distribution

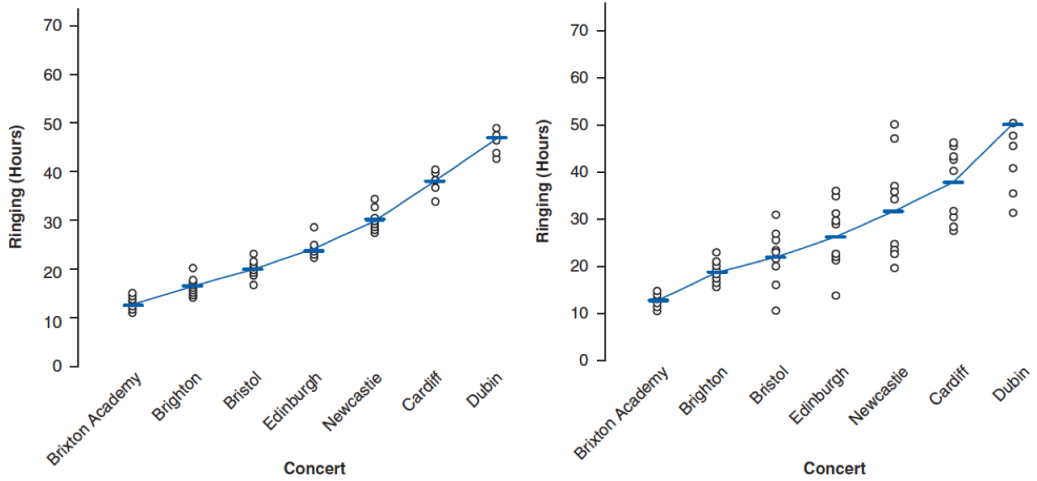
Like any statistical test, we calculate a test statistic. (Complicated math formula...look it up in Wikipedia if you dare)

Limitation: With large sample sizes it is very easy to get significant results from small deviations from normality. Therefore, use the three approaches shown here when testing for normality.

## Assumption of Homogeneity of Variance

The variance between groups or between different levels of a continuous variable is the same.

Homogeneity vs Heterogeneity of Variance:



## Levene's test

*H0* : The variances in different groups are equal
*H1* : The variances are different between groups.

How is it done?

It is simply a one-way ANOVA test!!!! Instead of comparing means between groups been different, we compare variances between groups.

## Literature

- Discovering Statistics using R: Chapter 5