# 1. Rough guidelines to interpret p-values.

First of all, be sure that you know what your null hypothesis is ($H_0$) and the alternative ($H_1$). Usually, $H_0$ is a statement like:

> *$X$ and $Y$ are independent*
>
> *A specific parameter value is equal to* 0
>
> *A normal distribution is suitable to describe my data* or the more colloquial *my data follows a Normal Distribution*

Relatively to the commonly used significance level of $\alpha = 0.05$, the p-value is often interpreted as:

a) p-value$< 0.01$, strong evidence against $H_0$

b) $0.01 <$p-value$< 0.05$, some evidence against $H_0$

c) $0.05 <$p-value$< 0.1$, weak evidence against $H_0$

d) p-value$> 0.1$, no evidence against $H_0$

We never accept $H_0$, we don't conclude that it is true. We know a priori that $H_0$ is not true and if we have no evidence against it, we fail to reject it. When we report a p-value, we're describing the probability of observing our data (or more extreme data) given the assumption that the null hypothesis is true. The convention is if this probability is low enough, we decide to reject the null and tentatively adopt the alternative.

For instance, testing independence for two variables, if we are in case d) we might say *the data shows no evidence that the variables are dependent.*