

Statistical Analysis 1: Anatomy of a statistical hypothesis test

Research Question: Usually exploring a comparison, association or relationship

Level of measurement of data: Usually Categorical or Scale (Continuous)

Two possible outcomes:

Null Hypothesis (NH or H_0):

Assumes no difference, association or relationship between the variables

Alternative Hypothesis (AH or H_1):

Assumes a difference, association or relationship between the variables

p-value:

A decision between the two hypotheses is made by viewing the 'p-value' or 'Sig-value' in SPSS, which is the probability (or chance) of getting the collected data (or more extreme) under the assumption of the null hypothesis.

If this probability is small, ' H_0 is rejected in favour of H_1 ', termed a 'statistically significant result'; otherwise 'fail to reject H_0 ', termed a 'non-statistically significant result'.

What is 'small'?

Conventionally, use $p=0.05$; hence, if

- $p \leq 0.05$ ('p is less than or equal to 0.05'), reject H_0 in favour of H_1
- $p > 0.05$ ('p is greater than 0.05'), fail to reject H_0 [NB Not always quite the same as 'accept H_0 ']

Alternatively, interpret the p-value so that:

- $p > 0.1$ implies no evidence to reject H_0
- $0.05 < p < 0.1$ implies some weak evidence to reject H_0
- $0.01 < p < 0.05$ implies evidence to reject H_0
- $p < 0.01$ implies strong evidence to reject H_0

Always relate outcome of the hypothesis testing back to particular variables in the study; don't just conclude with 'reject the null hypothesis'.