Understanding the Chi-square Test

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What is Chi-square?

The Chi-square (χ^2) test is a statistical method used to compare observed data with data we would expect to obtain according to a specific hypothesis. It measures the difference between expected and observed frequencies.

When to use it

- **Goodness-of-fit:** Does the sample data fit a specified distribution?

- **Test of independence:** Are two categorical variables independent?

- **Test of homogeneity:** Are distributions the same across populations?

SAS Code Example

Below is an example of a Chi-square test of independence using SAS:

```
data example;
   input Gender $ Preference $ Count;
   datalines;
Male   A 30
Male   B 20
```

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```
Female A 25
Female B 25
;
run;

proc freq data=example;
    tables Gender*Preference / chisq;
    weight Count;
run;
```

This tests whether `Gender` and `Preference` are independent.