

# Introduction to crosstabs

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Crosstabs are tables that summarize and analyze data by examining the relationships between two or more variables. They display the frequency of responses to a set of questions broken down into mutually exclusive categories. You could, for instance, compare how women and men answered those questions to find where their answers differ and where they are similar. Crosstabs are an excellent tool for identifying patterns and trends. An unweighted crosstab is a [contingency table](#).

The [Chi-square test of independence](#) (also called the Chi-squared test) is a standard measure of association between two categorical variables. It determines whether there is a significant relationship between the variables. If the two categorical variables are independent of one another, knowing the value of one provides no information about the value of the other variable. If one depends on the other, it can be worthwhile to examine their relationship. The crosstab does a Chi-square test for you.

Let's take a moment to consider categorical variables. Categorical variables can be described as those which cannot be ordered. For instance, genders don't fall into any natural order. You can order them as male, female, and non-binary or non-binary, female, male and so on. It doesn't matter what order you choose.

The same is true of political alignments. Democrat, Independent, and Republican are alphabetical, but those could be ordered in several other ways.

Ages, though, fall into numerical order, as do income ranges. They aren't categorical variables.

Given a random sample of two categorical variables, you can use the chi-square test to determine whether those variables are independent or dependent. Our [null hypothesis](#) is that they are not related or are independent of each other.

**Note:** Expected values of at least 5% must be present for each combination of our two categorical variables, or our test results will not be reliable.

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