

All about contingency table

A contingency table is a special type of frequency distribution table, where two variables are shown simultaneously. For example, **a researcher might be investigating the relationship between AIDS and sexual preference.** The two variables would be AIDS and SEXUAL PREFERENCE. Mordad 9, 1392 AP

AIDS * SEXPRERF Crosstabulation

Count

		SEXPRERF			Total
		Males	Females	Both	
AIDS	Yes	4	2	3	9
AIDS	No	3	16	3	21
Total		7	18	5	30

Chi-Square Tests

	Value	df	Asymp. Sig. (2-tailed)
Pearson Chi-Square	7.667 ^a	3	.022
Likelihood Ratio	7.600	3	.029
Linear-by-Linear Association	.062	1	.803
N of Valid Cases	30		

^a. 4 cells (66.7%) have expected count less than 5. The minimum expected count is 1.50.

What is a contingency table and why is it used?

A contingency table is **a tabular representation of categorical data**. A contingency table usually shows frequencies for particular combinations of values of two discrete random variables X and Y. Each cell in the table represents a mutually exclusive combination of X-Y values.

What is a 2x2 contingency table?

The two by two or fourfold contingency table **represents two classifications of a set of counts or frequencies**. The rows represent two classifications of one variable (e.g. outcome positive/outcome negative) and the columns represent two classifications of another variable (e.g. intervention/no intervention).

What does a contingency table measure?

Contingency tables (also called two-way frequency tables or crosstabs or cross-tabulations) are **used to find the relationship (association or dependencies) between two or more variables measured on the nominal or ordinal measurement scale**.

Where are contingency tables used?

In statistics, a contingency table (also known as a cross tabulation or crosstab) is a type of table in a matrix format that displays the (multivariate) frequency distribution of the variables. They are heavily used in **survey research, business intelligence, engineering, and scientific research.**

How do you identify a contingency table?

	PC	Mac	Row Totals
Male	66	40	106 (0.475)
Female	30	87	117 (0.524)
Column Totals	96 (0.430)	127 (0.570)	223

The process for calculating conditional probabilities using a contingency table is the following:

1. The numerator equals the count of occurrences for the specific combination events in which you're interested. This count is in a cell.
2. The denominator equals the count of occurrences for the "given" portion of the question.

What is the difference between a scatter diagram and a contingency table?

A contingency table is useful for nominal and ordinal variables, but not for quantitative variables. For quantitative variables, a scatterplot is more appropriate. Scatter plot displays relation between two quantitative variables exploratory variable will be in X axis and Response variable will be in y axis.

What is chi-square statistics and contingency table?

		SEXPREF			
		Male	Female	Both	
Observed		4	2	3	9
Expected		2.1	5.4	1.5	
(O-E) ² /E		1.72	2.14	1.5	
Observed		3	16	2	21
Expected		4.9	12.6	3.5	
(O-E) ² /E		.74	.92	.64	
		7	18	5	30

Hypothesis Testing with Contingency Tables

That is, **a statistic is computed and then compared to a model of what the world would look like if the experiment was repeated an infinite number of times when there were no effects.** In this case the statistic computed is called the chi-square statistic.

Is chi-square only for 2x2?

Only chi-square is used instead, because the dependent variable is dichotomous. So, a 2 X 2 ("two-by-two") chi-square is used when there are two levels of the independent variable and two levels of the dependent variable.

What is a Chi test used for?

A chi-square test is a statistical test used to **compare observed results with expected results**. The purpose of this test is to determine if a difference between observed data and expected data is due to chance, or if it is due to a relationship between the variables you are studying.

How do you create a contingency table?



Creating a basic contingency table. To create a contingency table of the data in the var1 column cross-classified with the data in the var2 column, **choose the Stat > Tables > Contingency > With Data menu option**. Select var1 as the Row variable, choose var2 as the Column variable, and click Compute!.

What graph is best for a contingency table?



If the variables are categorical, creating a contingency table should be a priority. After doing that, **a side-by-side bar chart** will be a great way to visualize the data. On the other hand, if the variables are numerical, a scatter plot will get the job most of the time.

What is a contingency graph?

A graph showing the profit or loss a currency speculator will realize on his/her positions under various exchange rates. That is, the contingency graph shows how much the speculator will gain or lose if the currency on which he/she is speculating moves to anywhere within the range of the graph.

What type of plot can be used to visualize a one way contingency table?

Mosaic plots can help visualize contingency tables, even those complex ones, consisting of many categorical variables. This kind of display can be very helpful in understanding simple and complex associations among categorical variables, especially for three- and more way tables.

What is p-value in chi-square?

Degrees of Freedom	Probability of Exceeding χ^2									
	0.99	0.95	0.90	0.85	0.80	0.75	0.70	0.65	0.60	0.55
1	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044
2	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100
3	0.0781	0.0781	0.0781	0.0781	0.0781	0.0781	0.0781	0.0781	0.0781	0.0781
4	0.1357	0.1357	0.1357	0.1357	0.1357	0.1357	0.1357	0.1357	0.1357	0.1357
5	0.2048	0.2048	0.2048	0.2048	0.2048	0.2048	0.2048	0.2048	0.2048	0.2048
6	0.2749	0.2749	0.2749	0.2749	0.2749	0.2749	0.2749	0.2749	0.2749	0.2749
7	0.3441	0.3441	0.3441	0.3441	0.3441	0.3441	0.3441	0.3441	0.3441	0.3441
8	0.4133	0.4133	0.4133	0.4133	0.4133	0.4133	0.4133	0.4133	0.4133	0.4133
9	0.4825	0.4825	0.4825	0.4825	0.4825	0.4825	0.4825	0.4825	0.4825	0.4825
10	0.5517	0.5517	0.5517	0.5517	0.5517	0.5517	0.5517	0.5517	0.5517	0.5517
12	0.6715	0.6715	0.6715	0.6715	0.6715	0.6715	0.6715	0.6715	0.6715	0.6715
14	0.7897	0.7897	0.7897	0.7897	0.7897	0.7897	0.7897	0.7897	0.7897	0.7897
16	0.9042	0.9042	0.9042	0.9042	0.9042	0.9042	0.9042	0.9042	0.9042	0.9042
18	1.0148	1.0148	1.0148	1.0148	1.0148	1.0148	1.0148	1.0148	1.0148	1.0148
20	1.1216	1.1216	1.1216	1.1216	1.1216	1.1216	1.1216	1.1216	1.1216	1.1216
22	1.2251	1.2251	1.2251	1.2251	1.2251	1.2251	1.2251	1.2251	1.2251	1.2251
24	1.3264	1.3264	1.3264	1.3264	1.3264	1.3264	1.3264	1.3264	1.3264	1.3264
26	1.4256	1.4256	1.4256	1.4256	1.4256	1.4256	1.4256	1.4256	1.4256	1.4256
28	1.5228	1.5228	1.5228	1.5228	1.5228	1.5228	1.5228	1.5228	1.5228	1.5228
30	1.6180	1.6180	1.6180	1.6180	1.6180	1.6180	1.6180	1.6180	1.6180	1.6180
32	1.7113	1.7113	1.7113	1.7113	1.7113	1.7113	1.7113	1.7113	1.7113	1.7113
34	1.8028	1.8028	1.8028	1.8028	1.8028	1.8028	1.8028	1.8028	1.8028	1.8028
36	1.8926	1.8926	1.8926	1.8926	1.8926	1.8926	1.8926	1.8926	1.8926	1.8926
38	1.9808	1.9808	1.9808	1.9808	1.9808	1.9808	1.9808	1.9808	1.9808	1.9808
40	2.0673	2.0673	2.0673	2.0673	2.0673	2.0673	2.0673	2.0673	2.0673	2.0673
42	2.1522	2.1522	2.1522	2.1522	2.1522	2.1522	2.1522	2.1522	2.1522	2.1522
44	2.2356	2.2356	2.2356	2.2356	2.2356	2.2356	2.2356	2.2356	2.2356	2.2356
46	2.3176	2.3176	2.3176	2.3176	2.3176	2.3176	2.3176	2.3176	2.3176	2.3176
48	2.3982	2.3982	2.3982	2.3982	2.3982	2.3982	2.3982	2.3982	2.3982	2.3982
50	2.4775	2.4775	2.4775	2.4775	2.4775	2.4775	2.4775	2.4775	2.4775	2.4775
52	2.5556	2.5556	2.5556	2.5556	2.5556	2.5556	2.5556	2.5556	2.5556	2.5556
54	2.6325	2.6325	2.6325	2.6325	2.6325	2.6325	2.6325	2.6325	2.6325	2.6325
56	2.7083	2.7083	2.7083	2.7083	2.7083	2.7083	2.7083	2.7083	2.7083	2.7083
58	2.7830	2.7830	2.7830	2.7830	2.7830	2.7830	2.7830	2.7830	2.7830	2.7830
60	2.8566	2.8566	2.8566	2.8566	2.8566	2.8566	2.8566	2.8566	2.8566	2.8566
62	2.9292	2.9292	2.9292	2.9292	2.9292	2.9292	2.9292	2.9292	2.9292	2.9292
64	3.0008	3.0008	3.0008	3.0008	3.0008	3.0008	3.0008	3.0008	3.0008	3.0008
66	3.0715	3.0715	3.0715	3.0715	3.0715	3.0715	3.0715	3.0715	3.0715	3.0715
68	3.1413	3.1413	3.1413	3.1413	3.1413	3.1413	3.1413	3.1413	3.1413	3.1413
70	3.2103	3.2103	3.2103	3.2103	3.2103	3.2103	3.2103	3.2103	3.2103	3.2103
72	3.2785	3.2785	3.2785	3.2785	3.2785	3.2785	3.2785	3.2785	3.2785	3.2785
74	3.3460	3.3460	3.3460	3.3460	3.3460	3.3460	3.3460	3.3460	3.3460	3.3460
76	3.4128	3.4128	3.4128	3.4128	3.4128	3.4128	3.4128	3.4128	3.4128	3.4128
78	3.4789	3.4789	3.4789	3.4789	3.4789	3.4789	3.4789	3.4789	3.4789	3.4789
80	3.5444	3.5444	3.5444	3.5444	3.5444	3.5444	3.5444	3.5444	3.5444	3.5444
82	3.6093	3.6093	3.6093	3.6093	3.6093	3.6093	3.6093	3.6093	3.6093	3.6093
84	3.6736	3.6736	3.6736	3.6736	3.6736	3.6736	3.6736	3.6736	3.6736	3.6736
86	3.7374	3.7374	3.7374	3.7374	3.7374	3.7374	3.7374	3.7374	3.7374	3.7374
88	3.8007	3.8007	3.8007	3.8007	3.8007	3.8007	3.8007	3.8007	3.8007	3.8007
90	3.8635	3.8635	3.8635	3.8635	3.8635	3.8635	3.8635	3.8635	3.8635	3.8635
92	3.9259	3.9259	3.9259	3.9259	3.9259	3.9259	3.9259	3.9259	3.9259	3.9259
94	3.9878	3.9878	3.9878	3.9878	3.9878	3.9878	3.9878	3.9878	3.9878	3.9878
96	4.0493	4.0493	4.0493	4.0493	4.0493	4.0493	4.0493	4.0493	4.0493	4.0493
98	4.1104	4.1104	4.1104	4.1104	4.1104	4.1104	4.1104	4.1104	4.1104	4.1104
100	4.1711	4.1711	4.1711	4.1711	4.1711	4.1711	4.1711	4.1711	4.1711	4.1711

P value. In a chi-square analysis, the p-value is **the probability of obtaining a chi-square as large or larger than that in the current experiment and yet the data will still support the hypothesis**. It is the probability of deviations from what was expected being due to mere chance.

What is chi-square test in simple terms?

Chi-square is **a statistical test used to examine the differences between categorical variables from a random sample in order to judge goodness of fit between expected and observed results**.

What is the null hypothesis in chi-square test?

Regarding the hypotheses to be tested, all chi-square tests have the same general null and research hypotheses. The null hypothesis states that **there is no relationship between the two variables**, while the research hypothesis states that there is a relationship between the two variables.

What is the minimum sample size for chi-square test?

Most recommend that chi-square not be used if the sample size is **less than 50**, or in this example, 50 F₂ tomato plants. If you have a 2x2 table with fewer than 50 cases many recommend using Fisher's exact test.

What are the two types of chi-square tests?

There are two commonly used Chi-square tests: the **Chi-square goodness of fit test and the Chi-square test of independence**.

Why is ANOVA used?

ANOVA is **helpful for testing three or more variables**. It is similar to multiple two-sample t-tests. However, it results in fewer type I errors and is appropriate for a range of issues. ANOVA groups differences by comparing the means of each group and includes spreading out the variance into diverse sources.

