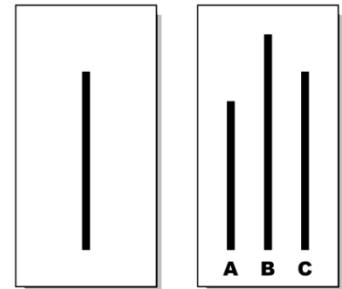


Two-Way Chi-Square Test Example in SPSS

Remember the Asch study from last week? Now, Dr. Mori wants to test whether there is a relationship between gender and the likelihood that people will conform.

Dr. Mori hypothesizes that females will be more likely to conform than males. To test his hypothesis, we will again use the 200 participants in the datafile **Asch.sav**.

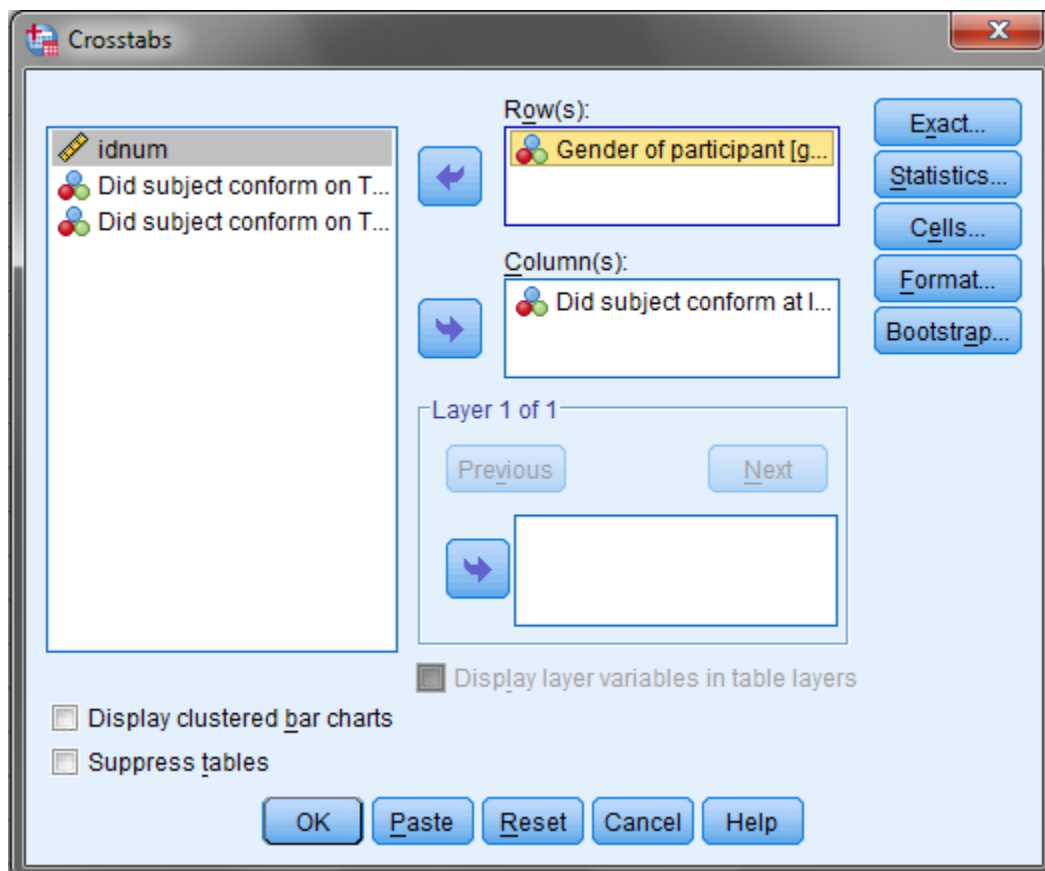


Step 1: What test should we use to test this hypothesis?

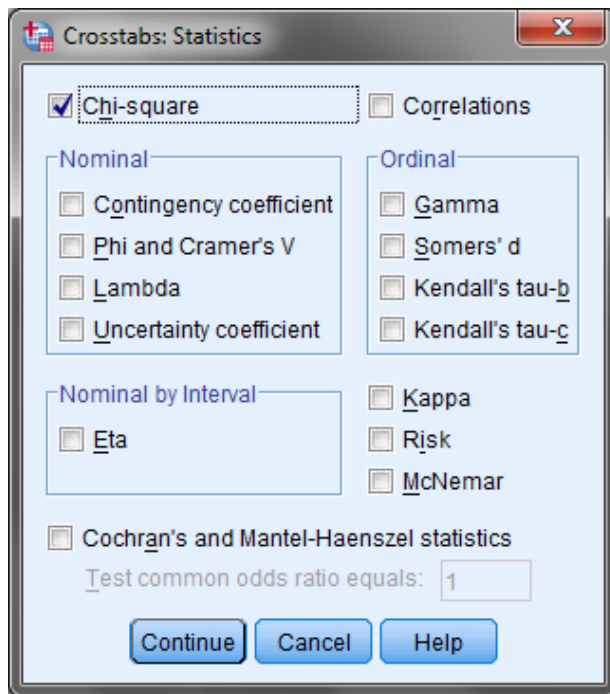
Because we are testing a relationship between TWO *categorical* variables (i.e., gender, and whether or not each person conformed), we use a two-way chi-square test.

Step 2: How do we run this test in SPSS?

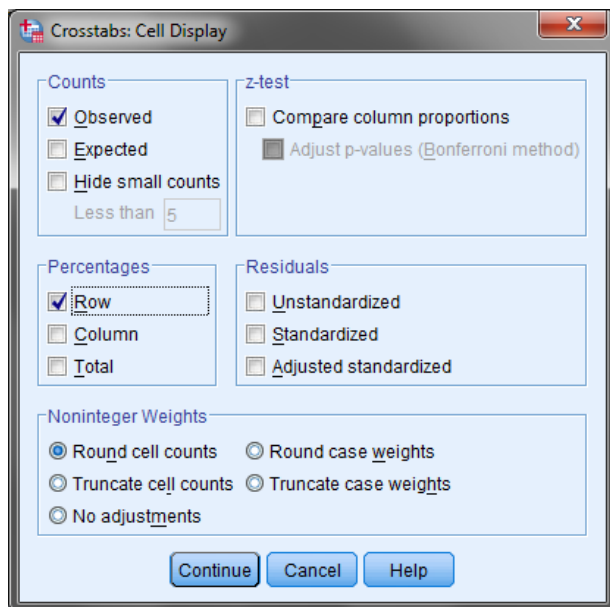
- Go to “Analyze” → “Descriptive Statistics” → “Crosstabs”



- Our independent variable goes into the “Row(s)” box.
- Our dependent variable goes into the “Column(s)” box.



- Click the “**Statistics...**” button on the right. In order to run our two-way chi-square test, we need to check the box that says “Chi-square.” Then, click “Continue.”



- Click the “**Cells...**” button on the right, and check the box next to “Row” under “Percentages.”

Because we can’t use means and *SDs* for categorical variables, these percentages will be our descriptive statistics.

- **Don’t click OK to run the test unless you have checked “Chi-square” and “Row”!**

Note: If we want, we could also ask SPSS to give us the “Expected Counts” (E) and the “Unstandardized Residuals” (O-E) for each cell. We needed to use these in order to calculate chi-square by hand, remember?

Step 3: How do we read the output from SPSS?

Gender of participant * Did subject conform at least once? Crosstabulation

			Did subject conform at least once?		Total
			No	Yes	
Gender of participant	Male	Count	33	67	100
		% within Gender of participant	33.0%	67.0%	100.0%
	Female	Count	24	76	100
		% within Gender of participant	24.0%	76.0%	100.0%
Total		Count	57	143	200
		% within Gender of participant	28.5%	71.5%	100.0%

1: We had 200 participants in our sample – 100 males and 100 females.

2: Of the 100 males in our sample, 67 of them conformed (i.e., 67.00%).

3: Of the 100 females in our sample, 76 of them conformed (i.e., 76.00%). However, we don't yet know if females were *significantly* more likely to conform than males.

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.987 ^a	1	.159		
Continuity Correction ^b	1.570	1	.210		
Likelihood Ratio	1.994	1	.158		
Fisher's Exact Test				.210	.105
Linear-by-Linear Association	1.978	1	.160		
N of Valid Cases	200				

4: These are the χ^2 (1.99) and df (1) values for our chi-square test. We will need to include these in our write-up, but they aren't terribly interesting on their own.

5: This is our p -value ($p = .159$), which tells us if the observed difference is significant (or not). Because our p -value is greater than .05, we conclude that gender was NOT related to conformity. In other words, females and males were equally likely to conform.

Step 4: How do we write up the results in APA format?

We hypothesized that females would be more likely to conform than males. A two-way chi-square test found no significant relationship between gender and whether or not a person conformed, $\chi^2(1) = 1.99, p = .159$. Contrary to our hypothesis, females ($n = 100; 76.00\%$) and males ($n = 100; 67.00\%$) were equally likely to conform.

A few things to notice about our write-up...

- 1)** We always begin our write-up by explicitly stating our hypothesis.
- 2)** Then, we name which test we did, and explain what the test showed. Did we, or didn't we, find a significant difference? This is where we will provide our test statistic (in this case, our χ^2 value), degrees of freedom, and our p -value.
- 3)** Finally, we *describe* our results by giving the sample sizes (n) and the relevant percentages from each of the groups that we compared.
- 4)** Notice that all non-Greek letters are italicized, every equals sign has a space both before and after it, and every number is rounded to two decimal places (except for p values, which are rounded to three decimal places).