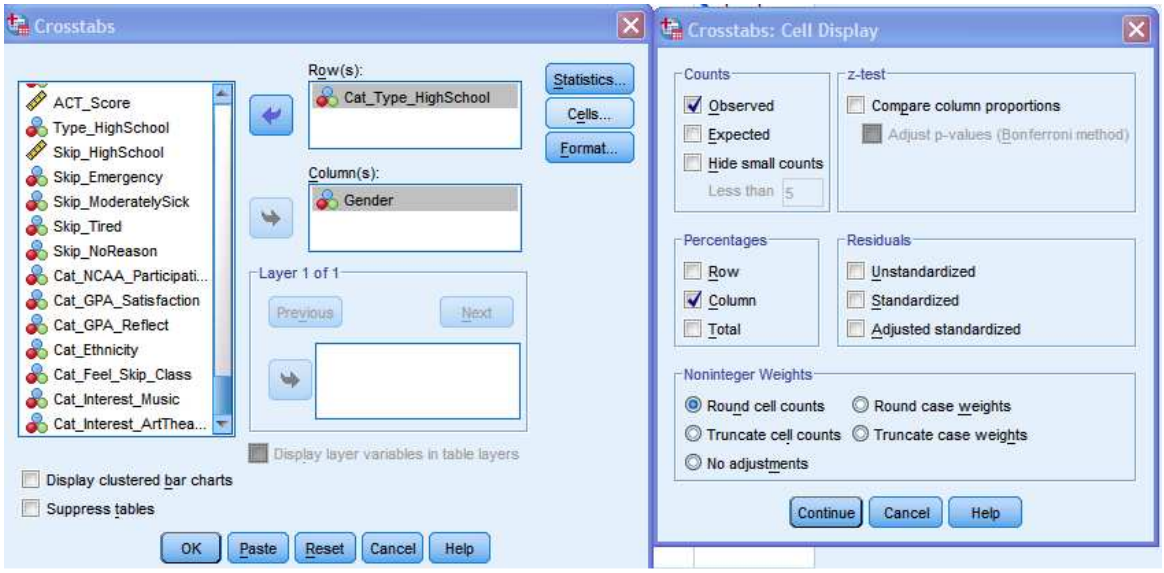
Comparing Two Proportions

We will use SPSS to compare the proportion of female Hope students that went to a private high school with the proportion of male students that went to a private high school.

Descriptive Statistics

Commands:

1. *Analyze>Descriptive Statistics>Crosstabs.*
2. Drag the explanatory variable into the "Column(s):" box.
3. Drag the response variable into the "Row(s):" box.
4. Under *Cells*…Check "Column" in the "Percentages" box.
5. Select *Continue.*
6. Select *OK.*



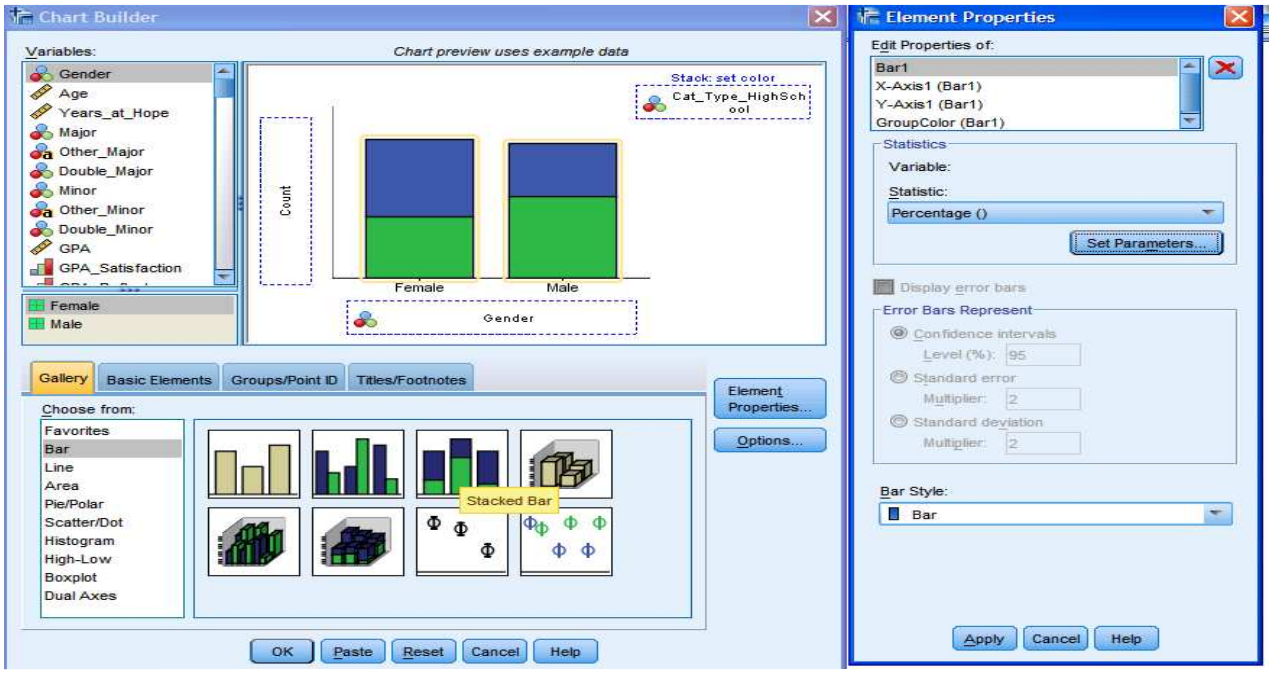
What type of HighSchool did you graduate from, private or public? * What is your gender? Crosstabulation

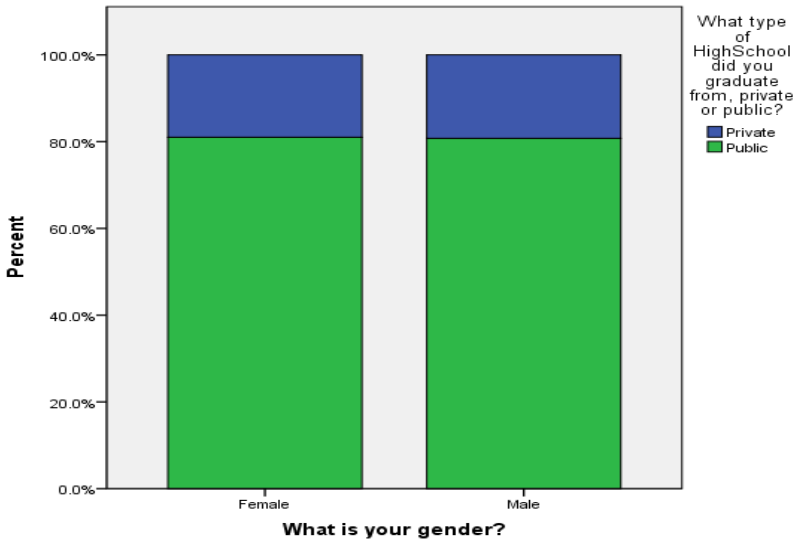
			What is your gender?		
			Female	Male	Total
What type of HighSchool did you graduate from, private or public?	Private	Count	117	47	164
		% within What is your gender?	19.0%	19.3%	19.1%
	Public	Count	499	197	696
		% within What is your gender?	81.0%	80.7%	80.9%
Total		Count	616	244	860
		% within What is your gender?	100.0%	100.0%	100.0%

Graphs

Commands:

1. *Graphs>Chart Builder>Bar.*
2. Drag the stacked bar to the upper window.
3. Drag the explanatory variable to the “X-Axis” box.
4. Drag the response variable to the “Stack: set color” box.
5. Under *Statistic:* choose *Percentage().*
6. Under *Set Parameters*… choose *Total for Each X-Axis Category*.
7. Select *Continue.*
8. Select *Apply.*
9. Select *OK.*

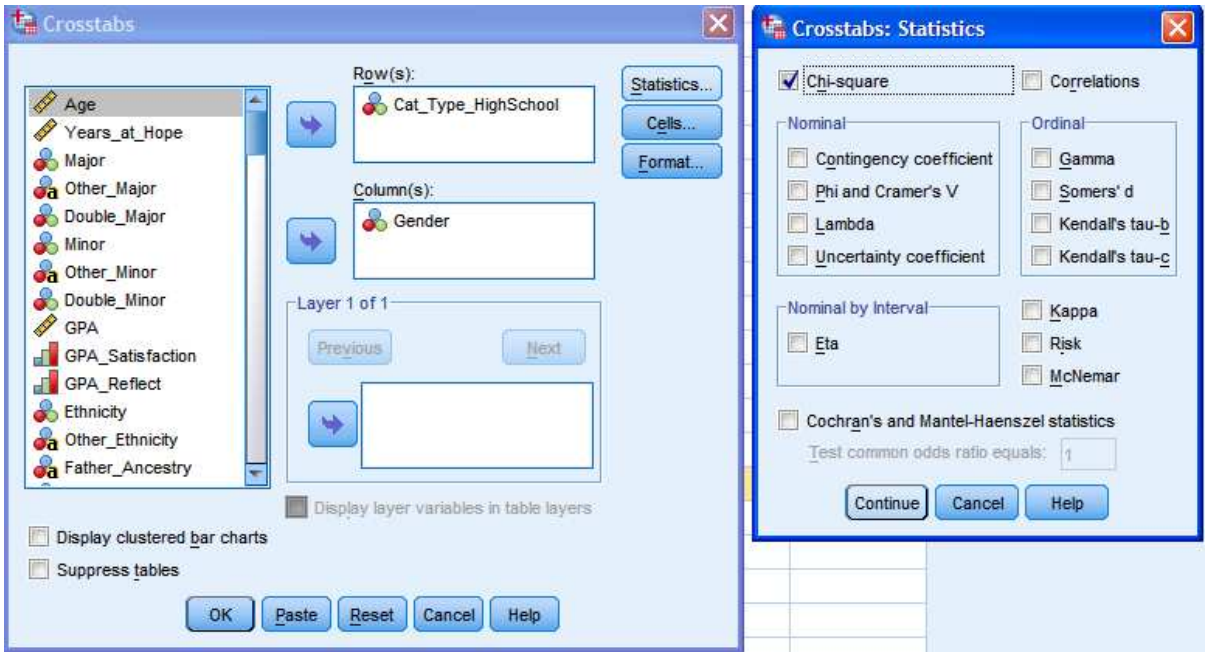




Inference

Commands:

1. *Analyze>Descriptive Statistics>Crosstabs.*
2. Drag the explanatory variable into the "Column(s):" box.
3. Drag the response variable into the "Row(s):" box.
4. Under *Statistics*…Check "Chi-Square."
5. Select *Continue.*
6. Select *OK.*



This box gives us the p-value of .928 (shown in red). The p-value is in the "Pearson Chi-Square" row and "Asymp. Sig. (2-sided)" column. Note that it is 2 sided.

Chi-Square Tests

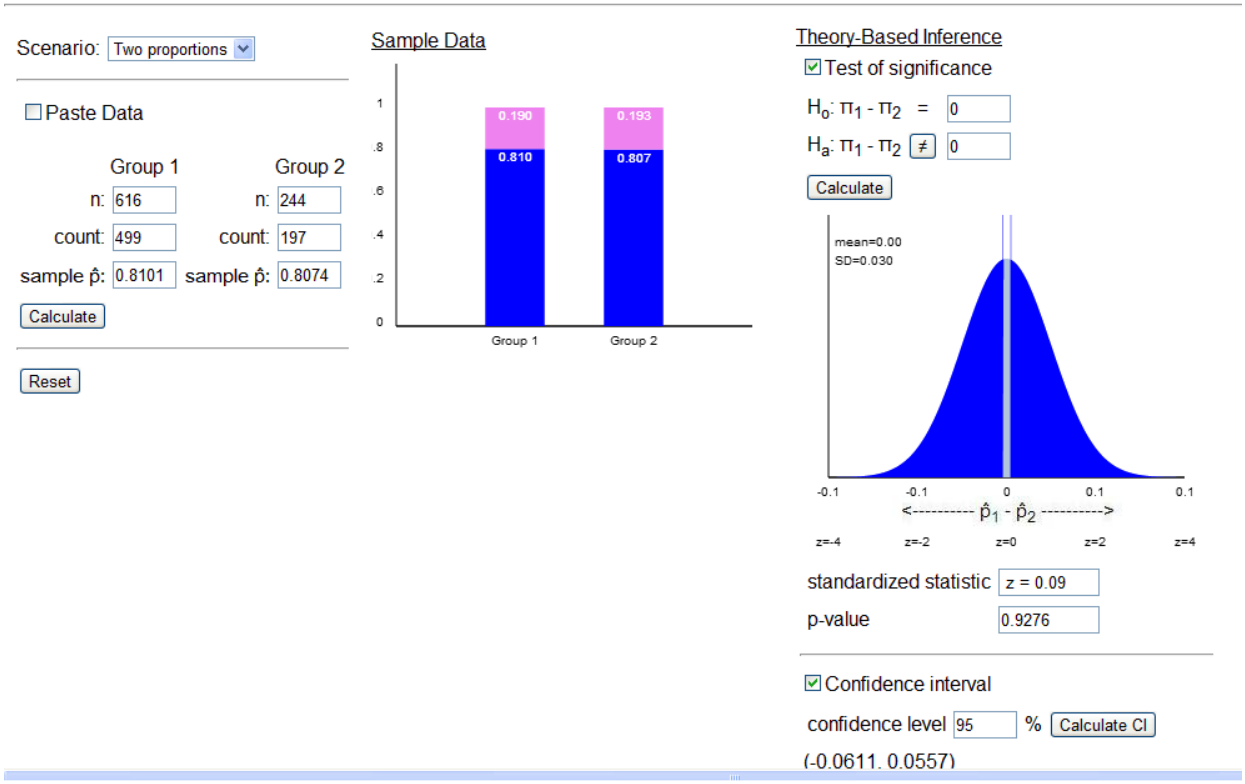
	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.008[a]	1	**.928**		
Continuity Correction[b]	.000	1	1.000		
Likelihood Ratio	.008	1	.928		
Fisher's Exact Test				.924	.499
Linear-by-Linear Association	.008	1	.928		
N of Valid Cases	860				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 46.53.

b. Computed only for a 2x2 table

Applet

After you have found descriptive measures, you may take that information and use it in the Theory-based applet. In fact, SPSS does compute confidence intervals for the difference in proportions, so if you want this you should use the applet. Below are the graphs, p-value and confidence interval for our example.



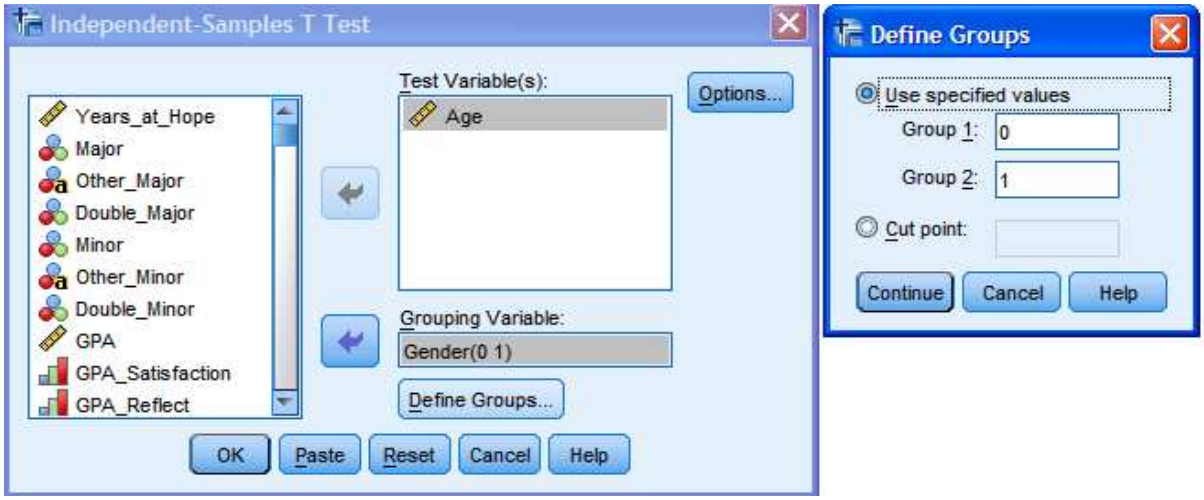
Comparing Two Means

We will use SPSS to compare the average age of female Hope students with the average age of male Hope students.

Descriptive Statistics and Inference

Commands:

1. *Analyze>Compare Means>Independent-Samples T Test…*
2. The "Test Variable" is the response variable (which should be quantitative).
3. The "Grouping Variable" is the explanatory variable (which should be categorical).
4. *Define Groups…* to indicate to SPSS which two groups are being compared. In the box "Group1," type in the variable value (as it appears in "Data View") for the first group (i.e.: "0"). In the box "Group 2," type in the variable value (as it appears in "Data View") for the second group (i.e.: "1"). Select *Continue*.



Group Statistics

	What is your gender?	N	Mean	Std. Deviation	Std. Error Mean
What is your age?	Female	643	20.1213	1.67655	.06612
	Male	259	20.2355	1.30982	.08139

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
What is your age?	Equal variances assumed	.004	.948	-.982	900	.326	-.11421	.11629	-.34245	.11402
	Equal variances not assumed			**-1.089**	604.998	**.276**	**-.11421**	.10486	**-.32015**	**.09172**

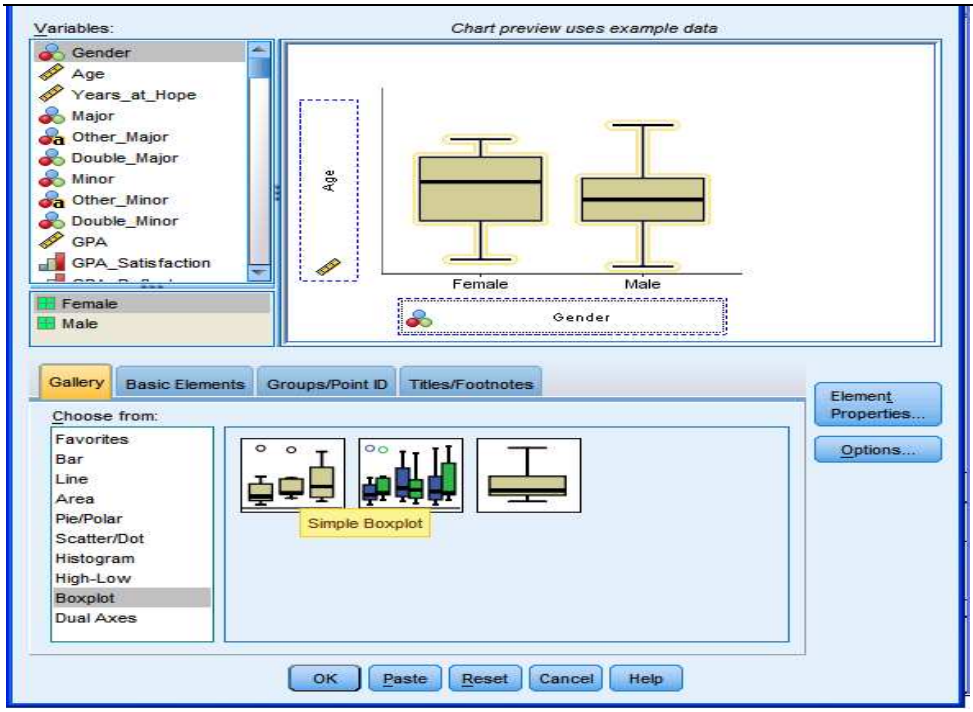
In red above are the standardized statistic (t-statisitc), the 2-sided p-value, our observed statistic (the difference in means) and a 95% confidence interval.

Note: SPSS will always give the two-sided p-value. To get the one-sided p-value (assuming that the sample mean of Group 1 is larger than Group 2 and the alternative hypothesis is such that the population mean of Group 1 is larger than Group 2), divide the SPSS two-sided p-value in half.

Graphs

Commands:

1. *Graphs>Chart Builder>Boxplot.*
2. Drag the simple boxplot to the upper window.
3. Drag the explanatory variable to the "X-Axis" box.
4. Drag the response variable to the "Y-Axis" box.
5. Select *OK.*



Shown here is side-by-side boxplots are shown of ages for males and females. The open circles represent potential outliers that are above the upper quartile + 1.5(IQR) and the asterisks

Applet

After you have found descriptive measures, you may take that information and use it in the Theory-based applet. If you have your data in SPSS in columns right next to each other, you may also paste that in the applet. Below are the graphs, p-value and confidence interval for our example.