EDUS362 Spring 2017

**Demo 2**

**Crosstabs and χ²-test**

**Exercise 1**

**Transform variables (continuous variable → categorical variable).**

Chi-square (χ2) test for independence is used when you have **two categorical variables.**

To conduct χ²-test, we transform continuous variable (a number of credits) into categorical variable (two groups).

**Exercise 1a**: Using “Visual Binning”

You can divide the sample into equal number of groups according to respondents’ score.

1. Go to SPSS menu “**Transform**” → “**Visual Binning**”.
2. Select the continuous variable (“Credit” in here) and move it to the “**Variables to Bin:**” box. Click on “**Continue**”.
3. In the “**Visual Binning**” screen, a histogram showing the distribution of credits should appear.
4. In “**Binned Variable:**” section, type the name for the new categorical variable (type “Credit\_gp2\_1” in here).
5. Click on “**Make Cutpoints**”.
6. Click on “**Equal Percentiles Based on Scanned Cases**”. In the “**Number of Cutpoints:**” box, specify a number one less than the number of groups that you want (you type “1” in here, because we want to create 2 groups). In the “**Width (%):**” section, you see “50.00” appear. This means SPSS will put 50% of the sample in each group. Click on “**Apply**”.
7. Double click on the first cell in the “**Label**” column and type “Credit < 31”. Next, double click on the second cell in the “**Label**” column and type “31 <= Credit”.
8. Click on “**OK**”.
9. SPSS will ask you whether it is okay to create 1 new variable, so click on “**OK**”.
10. Go to your “**Data Editor (Variable View)**” window and you will find the new variable from the bottom of the list.

**Exercise 1b:** Recoding a categorical variable with your own criteria

You can divide the sample with your cutpoints based on research or theoretical reasons.

E.g. Students who get credit less than 34 (Credit < 34) and students who get credit 34 or more (34 <= Credit)

1. Go to SPSS menu “**Transform**” → “**Recode into Different Variables**”.
2. Select the variable you wish to recode (“Credit” in here) and move it to the right box.
3. In the “**Name**” box, type a name for the new value (type “Credit\_gp2\_2” in here). Click on “**Change**”.
4. Click on “**Old and New Values**”.
5. In the “**Old Value**” box, click on “**Range, LOWEST through value:**” and type “33” in the section below. In the “**New Value**” box, select “**Value**” and type “1”. Click on “**Add**”.
6. Next, in the “**Old Value**” box, click on “**Range, value through HIGHEST:**” and type “34” in the section below. In the “**New Value**” box, select “**Value**” and type “2”. Click on “**Add**”.
7. Click on “**Continue**” and “**OK**”.
8. Go to your “**Data Editor (Variable View)**” window and you will find the new variable from the bottom of the list. Click on “Values” column in the new variable. Type “1” in the “**Value:**” box and “Credit < 34” in the “**Label:**” box. Click on “**Add**”. Next, Type “2” in the “**Value:**” box and “34 <= Credit” in the “**Label:**” box. Click on “**Add**”. Click on “**OK**”.

**Exercise 2**

**Conduct χ²-test and view table and crosstabs.**

Use two variables, “Gender” and “Credit\_gp2\_1”, in this exercise.

* Discuss in pair which is the independent variable and which is dependent variable.

Independent variable:

Dependent variable:

* Discuss in pair what are Null hypothesis (H0) and alternative hypothesis (H1):

H0:

H1:

* Test Hypotheses above using crosstabs and χ²-test:
1. Go to SPSS menu “**Analyze**” → “**Descriptive Statistics**” → “**Crosstabs**”.
2. Move the dependent variable (“Credit\_gp2\_1”) to the “**Row(s)**” box. Next, move the independent variable (“Gender”) to the “**Column(s)**” box.
3. Click on “**Statistics**” and tick “**Chi-square**” and “**Phi and Cramer’s V**”. Click on “**Continue**”.
4. Click on “**Cells**” and tick “**Observed**” in “**Counts**” box. Tick “**Row**”, “**Column**” and “**Total**” options in “**Percentages**” box.
5. Click on “**Continue**” and “**OK**”.

**Exercise 3**

**Report the result**

Open the Microsoft Word file and report the result you can see from table in SPSS (example is in the slide).

**Exercise 4**

**Create crosstabs in Excel**

* Use the SPSS Export facilities.

It is suited for more than one piece of output.

1. Choose table(s) and chart(s) that you want to export
2. Go to SPSS menu “**File**” → “**Export**”
3. Tick “**Selected**” option in “**Object to export**” box.
4. Choose “**Document**” type as “**Excel 2007 and Higher**”.
5. Click on “**Browse**”. Put the “**File name**” whatever you like and choose the your home directory (U-drive).
6. Click on “**OK**”.
7. Open the Excel file and edit it so as to be suitable for thesis/article.
8. Copy the edited table(s) or chart(s) and “**Paste as special**” to the Microsoft Word file.

**Discussion**

1. What are statistical hypotheses? How can you approve whether the hypotheses are rejected or not? What are independent and dependent variables?
2. What the crosstab indicates about the variables (Gender and Credit in here)?
3. What Chi-square tests results indicate (test statistic, degrees of freedom and statistical significance)? What is an effect size?