

# Math 110

Cross-Tabulation and  $\chi^2$  using SDA

April 26, 2010

The Survey Documentation & Analysis (SDA) web site at the University of California, Berkeley, is a large repository of social data for the United States and forty-one other countries. The data comes from several major studies, including the General Social Survey (GSS), the American National Elections Study, and U.S. Census Microdata. In addition, it provides web-based software to analyze and compare data in these studies. We will use the SDA site to generate (we hope) interesting cross-tabulations of data and to analyze the cross-tabulations.

## An Example

In order to illustrate the use of SDA, here is a simple example from class. To access SDA, go to the following URL:

*<http://sda.berkeley.edu/>*

On this page, click on the “Archive” button at the top-far left. This will bring you to the archive page. You will see a list of surveys on the left. The GSS surveys are the most general. For this example, choose the first survey listed:

GSS Cumulative Datafile 1972-2008

This will bring you to the study page. It has two parts:

- “Variable Selection” on the left. These are pull-down menus linking to a wide variety of study questions.
- “SDA Frequencies/Crosstabulation Program” on the right. We will insert variable names from the left-hand column into the entries on the right and check boxes to select different features.

We will use the software to generate a cross-tabulation by gender to the question: “Are you in favor of the death penalty for persons convicted of murder?” Here are the steps:

- Variable Selection: Click on the following in order for the row variable:
  - ATTITUDINAL MEASURES - NATIONAL PROBLEMS
  - Capital Punishment
  - CAPPUN2 - DOES R FAVOR CAPITAL PUNISHMENT
  - Enter the code CAPPUN2 in the “Row” box on the right.

Click on the following in order for the column variable:

- RESPONDENT BACKGROUND VARIABLES
- Age, Gender Race, and Ethnicity
- SEX - RESPONDENTS SEX
- Enter the code SEX in the “Column” box on the right.

- Table Options: To generate the table for the cross-tabulation click on “Run the Table,” which will cause the table to be displayed in a new window. To run the table with different options, close the table window, change the table options and run the table again.
  - The simplest option is to check ONLY the “Question text” box and “Color Coding”. This will produce a table and bar graph for the table. Notice the answers run down the left side of the table and gender across the top. It also shows column totals and row totals.
  - We can also filter the data. For example, enter “age(18-22)” in the filter box to see how college age responses differed by gender.
  - As we learn the  $\chi^2$  test, it will be useful to activate other features, for example, column, row, and total percentages. This allows us to compare percentages, which is important when the sample sizes are not the same. We can also compute the 95% confidence intervals for each entry of the table and  $\chi^2$  (and other) statistic(s).

### The Assignment

1. Browse the SDA archive to find row and column variables that interest you. Note that above we cross-tabulated by a demographic variable, gender. However, the cross-tabulation can be by the responses to another question.
2. Run the table showing: (i) Row, column, and total percentages; (ii) Summary statistics; (iii) Question Text; (iv) Sample Design SRS (v) Unweighted N; and (vi) Color Coding.
3. Print this table for your own use.
4. Decide whether the differences in the cross-tabulated responses are statistically significant for the degrees of freedom of the table. (Check the  $p$  values on “Chisq-P”.)
5. In a short paragraph or two, explain why you chose your variables, why the results are of interest, what the table is telling us and whether or not differences in responses are not significant, statistically significant, or highly significant.
6. Submit your printed tables along with this write up by 5 PM Thursday, April 29. We will look at a number of these in class.

### Submitting the Assignment

- Save the table page as “Web Page Complete.”
- Send your answer to 5. in an e-mail to [ddamiano@holycross.edu](mailto:ddamiano@holycross.edu).
- Attach your saved table to the e-mail.