

# HOW TO USE SPSS – THE BASICS

## Analytical Methods course – Kent State University

### Opening SPSS

- ❖ Go to the start menu and click on “programs”.
- ❖ Under SPSS for Windows, choose “SPSS X.0 (where X is the version) for Windows”

### Importing files to SPSS

- ❖ SPSS will open a welcome window. Close the window.
- ❖ Click File -> Open.
- ❖ Locate the file you want in the “look in” window
- ❖ Select “Microsoft excel” in “Files of Type” menu
- ❖ Hit “open”
- ❖ If you have more than one sheet in the Excel document, SPSS will ask which worksheet you want to open. Select the one you are interested and click OK.
- ❖ *NOTE: SPSS might cause problems if your extension is .xlsx (instead of .xls)*
- ❖ Once you import the data, save it in SPSS format!

### How to Label Your Values in the Spreadsheet

- ❖ Allows you to see descriptions of the data rather than simply the numbers (e.g., 1 = female, 2 = male)
- ❖ Go to View → Variables → Click in the “Values” cell of the variable for which you want to specify values
- ❖ Click in the grey box in the right-hand side of the cell
- ❖ Type in each numerical value (e.g., “1”) and the corresponding description of what that numerical value indicates (e.g., “female”).
- ❖ Click “Add,” and repeat until you have named all the values.
- ❖ Click “OK.”

### How to Change the Type of Your Variable

- ❖ E.g., to change a “string” variable to a “numeric” variable
- ❖ View → Variables → Click in the “Type” cell of the variable for which you want to specify the type
- ❖ Click in the grey box in the right-hand side of the cell, and click on the number of the appropriate type.
- ❖ Click “OK.”
- ❖ *NOTE: This is important, as certain analyses will not accept certain types of variables. For instance, regression will not take string variables.*

### Data manipulation

- ❖ You can manipulate your data in many ways using SPSS, so as to quickly set up the data to perform the analyses you need.
  - **Transform text data to numerical values**
    - Suppose you record results from a Likert using verbal anchors: “Strongly Agree” and so forth. You may need to transform these strings into numbers.
    - Transform → Automatic recode → Select variable → Assign new name → Click “Add new name” → Select any additional options → Click OK.

### Data manipulation (cont.)

- **Create new categories based on a single variable**
  - Suppose you have a Likert-scaled attitude item. You may want to create a two-box report by recording a new variable with the values "1=Subject's attitude > 3", and "2=Subject's attitude <= 3".
  - In another example, if you have a number of variables that record favorite hobbies, if a set of hobbies =1, you can create a larger hobby category. E.g. "If Personal, Team, or Extreme sports =1, then SPORTS category = 1".
  - Transform → Compute variable → Name target variable → Define type (measurement level) and label (optional) → Click OK.
- **Count number of multiple choices selected by subjects**
  - Suppose you requested that subjects report all types of media they use daily. Each media is a different column. Some people will use one, some two, some three, and so forth. You can record this sum easily:
  - Transform → Count variables within cases → Select all required columns → Define values (which ones will be counted, typically "1") → Click OK.

### Descriptive Statistics - numbers and tables

- ❖ In order to obtain descriptive statistics with SPSS, go to the “Analyze” menu and select “Descriptive Statistics”
  - If you choose “**Frequency**,” you will be able to obtain the frequency distribution of a variable.
    - By clicking on “Statistics,” you can specify the descriptive statistics you want (like mean, median, mode, standard deviation etc.) as well as percentile values
    - By clicking on “Charts,” you can specify the graphs you want (like bar charts, pie charts, and histograms)
  - If you choose “**Descriptives**,” you can get also get similar information.
    - Choose “options” and specify the statistics you want to obtain.
  - If you choose “**Explore**,” you can get more or less every descriptive statistic (including a histogram) for different groups. Make sure your variables are numerically coded.
    - By clicking on “Statistics,” you can specify the descriptive statistics you want.
    - By clicking on “Charts,” you can specify the graphs you want
  - If you choose “**Crosstabs**,” you can create cross-tabulated tables and obtain chi-square statistics.
    - By clicking on “Statistics,” you can request a chi-square test
    - By clicking on “Cells,” you can specify the content of the cross-tab (ie: observed values, expected values, percentages)

### Descriptive Statistics - charts, histograms, boxplots...

- ❖ To produce charts such as histograms, you have several options:
  - If you choose “**Graphs** → **Legacy dialog**” you will be able to produce line charts, boxplots, histograms, and other charts. Each type of chart has different requirements.
    - In *general*, if you select "Summaries for groups of cases" you'll plot only one variable. If you want to plot multiple variables in the same chart, select "Summaries of separate variables".
    - For example, if you choose the first option, you will only be able to produce one box plot (suitable for single variables). However, if you want to plot multiple box

plots in a single chart (such as in the Dodge Dart example in class) you will require to use the second option.

### **Descriptive Statistics - charts, histograms, boxplots... (cont.)**

- If you choose “**Graphs → Chart Builder**” you can interactively select a large number of different charts and plots. Most importantly, you will be able to produce **bivariate** plots, that is, plots by different nominal categories.
  - In the Chart Builder, select a chart type from the gallery (e.g. a boxplot).
  - If you want a *univariate* plot, simply add the variables you want to add to the Y-Axis.
  - If you want a *bivariate* plot, add your Dependent Variables (or the variable you're interested in) in the Y-Axis and your Independent Variable (or the categories you want to explore) in the X-Axis. For example, if we wanted to make boxplots or histograms of Sales by the four major US regions, you would drop Sales in the Y-Axis and US Regions in the X-Axis.
- If you choose “**Graphs → Graphboard Template Chooser**” you can easily select between different types of graphs that best fit each one of your variables.

### **Testing One-Sample Mean**

- ❖ To test the difference of the sample mean from a given number, we use “One-Sample T test”
  - Go to “Analyze,” select “Compare means” and choose “One-Sample T test”
  - Enter the variable of interest to “test variable” box
  - Specify your test value in the “test value” box
  - Hit OK

### **Testing Mean Difference of Independent Samples**

- ❖ To test the difference of the sample mean for two separate groups, we use “Independent-Samples T test”
  - Go to “Analyze,” select “Compare means” and choose “Independent-Samples T test”
  - Enter the variable of interest to “test variable” box
  - Specify your grouping variable and enter it in the “grouping variable” box
    - Click on “define groups” and enter the values (as exactly appeared in the data set) of the two groups you have
  - Hit OK

### **Testing Mean Difference for Paired Samples**

- ❖ To test the difference of the sample mean for two separate groups, we use “Independent-Samples T test”
  - Go to “Analyze,” select “Compare means” and choose “Paired-Samples T test”
  - Choose two continuous variables to enter to the “Paired Variables” box. You can do this either by highlighting them both or adding two variables sequentially.
  - Hit OK
- ❖ NOTE: you can put in more than one pair when you are conducting this test.

### **Calculating Correlation**

- ❖ To compute and test correlations, we use “correlate”
  - Go to “Analyze,” select “Correlate” and choose “Bivariate”
  - Enter the variables you want to get correlations for to “Variables” box
  - Choose “Pearson” under correlation coefficients if you have continuous variables

- Choose “Spearman” under correlation coefficients if you have ordinal variables

### **Calculating Correlation (cont.)**

- Indicate whether you want a one-tailed or two-tailed test (the default and most common use is two-tailed)
- If you want to get additional statistics (like descriptives), hit “options” and specify.

### **Performing Regression**

- ❖ To perform regression analysis, we use “Linear regression”
  - Go to “Analyze,” select “Regression” and choose “Linear”
  - Enter your DV to “Dependent” box
  - Enter your IV’s to “Independent” box
  - By clicking on “statistics” you ask for different types information, including descriptive statistics and R-square change.
- ❖ NOTE: When using regression, you can either have continuous IV’s or dummy coded categorical IV’s. Under any case, if you want to test interactions, you need to create separate variables in your data and then enter those variables into the “independent” box.

### **Performing Logistic Binary Regression**

- ❖ To perform regression analysis, we use “Linear regression”
  - Go to “Analyze,” select “Regression” and choose “Binary Logistic”
  - Enter your DV to “Dependent” box
  - Enter your IV’s to “Covariates” box
  - Hit OK
- ❖ NOTE: When using binary logistic regression, your DV MUST be dichotomous (categorical with two levels). Your IVs can be continuous or dummy coded categorical. Under any case, if you want to test interactions, you need to create separate variables in your data and then enter those variables into the “independent” box.

### **Additional resources**

The following resources are invaluable in aiding your understanding of SPSS. Do not hesitate to use them if you run into trouble with SPSS. Also, contact the instructor if you have questions regarding the software.

- ❖ [UCLA ATS SPSS Guide](#) - a very large and comprehensive guide to using SPSS. The section on "[Which statistical analysis should I use?](#)" is invaluable.
- ❖ [VCU SPSS Help Sheets](#) - great resource for statistical tests, one per sheet.
- ❖ [Cal State LA SPSS tutorials](#) - resource with videos.
- ❖ [UMass School of Public Health's SPSS Statistics Basics](#) - good beginner's resource, with screenshots.

### **Notes**

I thank Prof. Selin Malkoc for providing her own SPSS handout on which this document is based on.