Lecture Outlines

# Chapter 2: Summarizing Data: Frequency Distributions in Tables and Graphs

## Learning Objectives

After reading this chapter, you should be able to

1. Construct a simple frequency distribution for grouped and ungrouped data.

2. Determine whether data should be grouped or ungrouped.

3. Identify when it is appropriate to distribute the cumulative frequency, relative frequency, relative percent, cumulative relative frequency, and cumulative percent.

4. Identify percentile points and percentile ranks in a cumulative percent distribution.

5. Construct and interpret graphs for distributions of continuous data.

6. Construct and interpret graphs for distributions of discrete data.

7. Construct frequency distributions for quantitative and categorical data using SPSS.

8. Construct histograms, bar charts, and pie charts using SPSS.

## Lecture Suggestions (in Support of the Learning Objectives)

Learning Objectives 1–2 Suggestions. Sections 2.1, 2.2, and 2.5 are a great reference for these learning objectives. Students often need to see why concepts are needed. It is useful to begin by showing them how summarizing data graphically can make patterns in data clearer. The example in Section 2.1 explains why researchers summarize data graphically and in tables. The construction of a simple frequency distribution is summarized in three steps. You should use these steps in your classes. The example in the chapter intentionally includes an outlier so you can easily illustrate open classes in addition to discussing boundaries, intervals, and classes.

In support of Learning Objective 2, the first 10 questions in the **Summarizing Frequency Distributions Exercise** give students situations in which they must decide whether data should be grouped or ungrouped.

Learning Objectives 3-4 Suggestions. Sections 2.2 and 2.3 are great references for meeting this learning objective. Learning Objectives 3 and 4 build on the previous learning objective in that students must decide how to summarize frequency data. The example in the book illustrates the different ways that students will see frequency distributions summarized in research articles. This section also explains why and when these different distributions are used (a decision-focused discussion).

The last ten questions of the **Summarizing Frequency Distributions Exercise** are included to support these learning objectives. It is a great resource to work through with students or to assign as homework. It will help students see different examples in which they make decisions pertaining to summarizing grouped and ungrouped data. You should also consider including Section 2.6 (Research in Focus) in your classroom discussions. This section gives students a context for how frequency distributions for grouped and ungrouped data are used to summarize demographic information in published articles. This is a simple read that helps them see how frequency distributions can make a lot of information easily and quickly accessible to the reader.

Learning Objective 5 Suggestions. Section 2.9 is a great reference for meeting this learning objective. Each heading works through an example and gives students a step-by-step approach for constructing the graphs. Again, I suggest using the problems and examples in this chapter during class. I have found this sort of participant modeling in class to be helpful to students of all learning styles. Students often have questions as they read. If you work through the examples in their readings, you can essentially help them answer their own questions.

Learning Objective 6 Suggestions. Section 2.10 is a great reference for meeting this learning objective. Again, each heading works through an example and gives students a step-by-step approach for constructing the graphs. It will again be useful to work through the same examples worked through in the book. But again, it is best to cover material in your comfort zone, so this is just a suggestion. As part of this talk, you may want to read and discuss the research described in Section 2.11. This section brings Learning Objectives 5 and 6 together and helps students recognize that “not all graphs are created equally,” so to speak.

Learning Objectives 7–8 Suggestions. These learning objectives are taught in Sections 2.4, 2.7, and 2.12. Refer to the templates for SPSS given for this chapter. These templates are designed to complement any lab assignment you want to give (even one not from the book) for constructing frequency distributions and graphs using SPSS. Also, SPSS exercises are included in the study guide for each SPSS in Focus section. I strongly recommend that you assign an exercise to students or do it together with students in class, if students are required to use the study guide with this book.

*Additional suggestion*. Please refer to the SPSS template for histograms, bar charts, and pie charts. The last question in that template asks students the following: “For your own reference, state which display [histogram, bar chart, or pie chart] is easiest for you to read. Please pick only one. There is no right or wrong answer here. It is simply worth recognizing the type of display that makes most sense to you.”

In class, you can record the responses to this question, distribute them in a frequency distribution for categorical data, and then create a bar chart for the same data. When you show students the results in class, this often leads to interesting conversations and opinions with regard to the “best” way to display data. So this little exercise can reinforce previous lectures as well as gauge student interest. This is something to consider for your classes if you find the time. This exercise requires about 10 to 15 min of class time (sometimes more if class participation is high).