Summarizing and Presenting Data in Quantitative Research

Chapter Summary

You have collected your data. Now what are you going to do with the stacks of information you have collected? Just as the steps prior, data analysis involves a series of decisions you need to make. This chapter provides an introduction to presenting data collected using quantitative research. Summarizing and organizing data involves four steps:

1. Identify the data to be included and excluded from your report.
2. Select the categories by which to summarize the raw data.
3. Code the data whereby they are sorted according to the selected categories.
4. Present the data in a summarized form that aids in drawing conclusions.

Data can be categorized and summarized in many different ways including tables, graphs, and charts. **Contingency tables** (**cross tabulations**) describe a relationship between the values of two variables. **Bar graphs** and **pie graphs** are two additional means of displaying summarized data. Both of these depict visually how much/many of something is present. A **scattergram** is produced by pinpointing each instance of measurement on a grid defined by the two axes of a graph. The two lines along which units are marked are called *axes*, and the space between them is defined by the grid formed by the intersecting lines drawn from each unit point along the two axes. The first step in constructing a scattergram is to decide on the scale of units to be used on each axis. A **line graph** is similar to a scattergram with the exception that consecutive points are joined by lines, making up one complete line joining all the data points. **Means**, or averages, are often used to compare groups and offer summary results of the data. The tables, graphs, and/or charts you use will depend on what is best suited to display or represent your data.

Key Terms

Bar graph (histogram) A visual representation of the effect of an independent variable on a dependent variable. The graph appears as a series of bars that align along the *x*-axis (horizontal axis). (p. 228)

Cross-tabulation A term used in quantitative research referring to the creation of a table that includes the effect of one independent variable on one dependent variable. (p. 225)

Frequency The distribution of cases on a particular variable. For example, in a study of 100 Canadians, the frequency of males in the sample is 54 while the frequency of females is 46. Frequency distributions are important information to present in research studies so readers have an idea of the demographic characteristics of the sample. (p. 226)

Line graph A variation of the scattergram where the intersections of continuous level independent and dependent data are plotted on a graph for each individual case and a best-fit line through the points is drawn. (p. 233)

Marginal totals The numbers indicating the sum of all cells in a single row or column. They provide information about the total sample and are important information for quantitative research tables. (p. 226)

Means A statistical calculation that depicts the average score of a variable. The mean or average is calculated by summing the scores of each individual on the selected variable then dividing that number by the total number of individuals in the study. (p. 241)

Pie graph Displays the frequency distribution of a single variable. This type of graph is appropriate for categorical (nominal) variables. (p. 228)

Scattergram A type of graph that identifies the intersection between the independent and dependent variables for single cases on a graph. It is appropriate for continuous level independent and dependent variables. (p. 232)

Study Questions

Scroll down for answers.

1. Why do researchers categorize their data? List three basic ways by which data can be categorized.

2. What are the basic differences between bar graphs and pie graphs? When is it appropriate to use pie graphs?

3. What is tabular presentation? What are marginal totals?

4. What is a line graph? When is it useful to use a line graph? What are the advantages and disadvantages of a line graph?

5. Why do raw data need to be categorized?

6. What are the five steps to constructing a line graph?

7. How do you calculate an average?

8. Why should averages be used and interpreted with care?

9. What is the first step in constructing a scattergram?

10. What the four steps of summarizing and organizing your data?

Video Resources

Researcher Hans Rosling's analyses offer a unique and creative way of presenting data. The following two videos are highly recommended. Updated content, including many graphs and charts, can be found at www.gapminder.org as well.

Video (19:50) "Best stats you've ever seen"
http://www.ted.com/talks/hans_rosling_shows_the_best_stats_you_ve_ever_seen.html

Video (18:57) "New insights on poverty"
http://www.ted.com/talks/lang/en/hans_rosling_reveals_new_insights_on_poverty.html

Answers to Study Questions

1. Researchers categorize their data because categories make it possible to summarize and present the data. Three basic ways to categorize data are tabular presentation, graphical presentations, and means. (p. 222)

2. In a bar graph, the graph appears as a series of bars that align along the horizontal axis where the effect of an independent variable on a dependent variable can be depicted. In a pie graph, only the frequency distribution of a single variable can be depicted as "slices" of the pie. Pie graphs are appropriate when a researcher wishes to analyze the proportion of a variable's categories over the entire population. (pp. 228–232)

3. A tabular presentation is a table that includes the effect of one independent variable on one dependent variable. Marginal totals consist of the numbers indicating the sum of all cells in a single row or column in a cross-tabulation. Data in tabular form provide information about the total sample and are an important feature of quantitative research. (pp. 225–226)

4. A line graph plots the intersection of a continuous level independent variable with that of a dependent variable and a best-fit line is drawn through the plotted points. It is useful in that it compares information very clearly, especially in policy analysis. An advantage is that it smooths out some of the detail in a line graph whereas a disadvantage is that some of the variation between the data points may be lost. (pp. 233–241)

5. Raw data needs to be categorized because not all of the data that have been collected can be used in the analysis. Categorization allows for analysis of patterns in the data. (p. 243)

6. Five steps for constructing a line graph:
   - Select the categories for your data
   - Code the data in to categories
   - Select a scale of units for each axis
   - Plot the data points
   - Link the points with lines

   (pp. 240–241)

7. To calculate an average, you add up all the individual data/scores and then divide by the number of individuals/scores. (p. 241)

8. The average tells us nothing for certain about an individual in a group. The average is also affected by extreme high or low scores. (p. 241)

9. The first step is to decide on the scale of units to be used on each axis. (p. 233)

10. The four steps of summarizing and organizing data:
    - Identify the data to included and excluded from your report
    - Select the categories in which the raw data can be summarized

- Code the data—that is, sort them into categories
- Present the data in a form that helps you draw conclusion

(p. 221)