

*Practice Exercise*

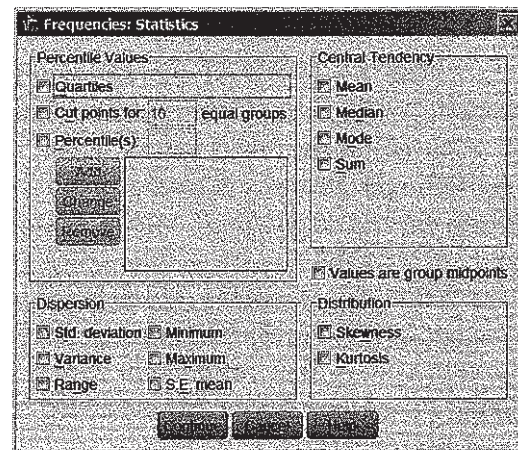
Using Practice Data Set 1 in Appendix B, create a contingency table using the *Crosstabs* command. Determine the number of participants in each combination of the variables SEX and MARITAL. What percentage of participants are married? What percentage of participants are male and married?

### Section 3.3 Measures of Central Tendency and Measures of Dispersion for a Single Group

*Description*

Measures of central tendency are values that represent a typical member of the sample or population. The three primary types of measures are the **mean**, **median**, and **mode**. Measures of dispersion tell you the variability of your scores. The primary types are the **range** and the **standard deviation**. Together, a measure of central tendency and a measure of dispersion provide a great deal of information about the entire data set.

We will discuss these measures of central tendency and measures of dispersion in the context of the *Descriptives* command. Note that many of these statistics can also be calculated with several other commands (e.g., the *Frequencies* or *Compare Means* commands are required to compute the **mode** or **median**—the *Statistics* option for the *Frequencies* command is shown to the right).

*Assumptions*

Each measure of central tendency and measure of dispersion has different assumptions associated with it. The **mean** is the most powerful measure of central tendency, and it has the most assumptions. For instance, to calculate a **mean**, the data must be measured on an **interval** or **ratio scale**. In addition, the distribution should be normally distributed or, at least, not highly skewed. The **median** requires at least **ordinal** data. Because the **median** indicates only the middle score (when scores are arranged in order), there are no assumptions about the shape of the distribution. The **mode** is the weakest measure of central tendency. There are no assumptions for the **mode**.

The **standard deviation** is the most powerful measure of dispersion, but it, too, has several requirements. It is a mathematical transformation of the **variance** (the **standard deviation** is the square root of the **variance**). Thus, if one is appropriate, the other is also appropriate. The **standard deviation** requires data measured on an **interval** or **ratio scale**. In addition, the distribution should be normal. The **range** is the weakest measure of dispersion. To calculate a **range**, the variable must be at least **ordinal**. For **nominal scale** data, the entire frequency distribution should be presented as a measure of dispersion.

### Drawing Conclusions

A measure of central tendency should be accompanied by a measure of dispersion. Thus, when reporting a **mean**, you should also report a **standard deviation**. When presenting a **median**, you should also state the **range** or interquartile **range**.

### SPSS Data Format

Only one variable is required.

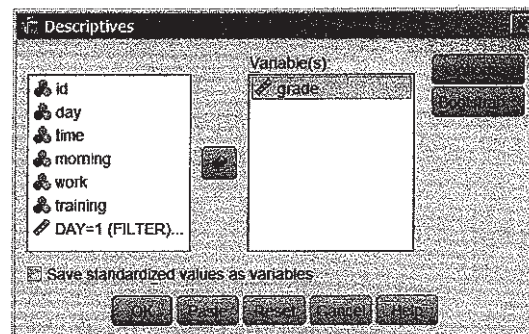
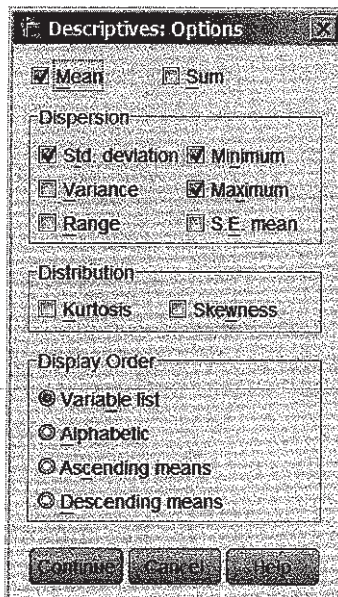
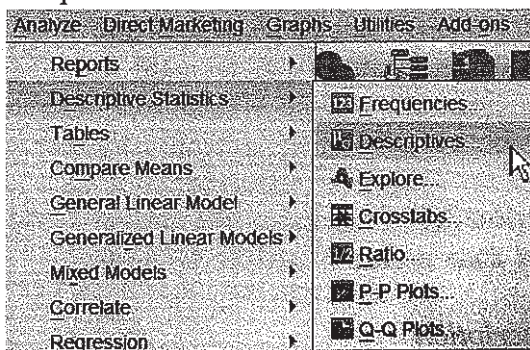
### Running the Command

The *Descriptives* command is the command you will most likely use for obtaining measures of central tendency and measures of dispersion. This example uses the SAMPLE.sav data file we used in the previous chapters.

To run the command, click *Analyze*, then *Descriptive Statistics*, then *Descriptives*. This will bring up the main **dialog box** for the *Descriptives* command. Any variables you would like information about can be placed in the right blank by double-clicking them or by selecting them and then clicking on the arrow. Move the variable GRADE to the right for this example.

By default, you will receive the *N* (number of cases/participants), the minimum value, the maximum value, the **mean**, and the **standard deviation**. Note that some of these may not be appropriate for the types of data you have selected.

If you would like to change the default statistics that are given, click *Options* in the main **dialog box**. You will be given the Options **dialog box** shown to the left. Click *Continue* or *Cancel* to close the *Options* box. Then click *OK*.





*Reading the Output*

The output for the *Descriptives* command is quite straightforward. Each type of output requested is presented in a column, and each variable is given in a row. The output presented below is for the sample data file. It shows that we have one variable (GRADE) and that we obtained the *N*, minimum, maximum, **mean**, and **standard deviation** for this variable.

	N	Minimum	Maximum	Mean	Std. Deviation
grade	4	73.00	85.00	80.2500	5.25198
Valid N (listwise)	4				

*Practice Exercise*

Using Practice Data Set 1 in Appendix B, obtain the **descriptive statistics** for the age of the participants. What is the **mean**? The **median**? The **mode**? What is the **standard deviation**? Minimum? Maximum? The **range**? (Refer to Section 3.1 for assistance with **median** and **mode**.)

### Section 3.4 Measures of Central Tendency and Measures of Dispersion for Multiple Groups

*Description*

The measures of central tendency discussed earlier are often needed not only for the entire data set, but also for several subsets. One way to obtain these values for subsets is to use the data-selection techniques discussed in Chapter 2 and apply the *Descriptives* command to each subset. An easier way to perform this task is to use the *Means* command. The *Means* command is designed to provide **descriptive statistics** for subsets of your data.

*Assumptions*

The assumptions discussed in the section titled “Measures of Central Tendency and Measures of Dispersion for a Single Group” (Section 3.3) also apply to multiple groups.

*Drawing Conclusions*

A measure of central tendency should be accompanied by a measure of dispersion. Thus, when giving a **mean**, you should also report a **standard deviation**. When presenting a **median**, you should also state the **range** or interquartile **range**.

*SPSS Data Format*

Two variables in the SPSS data file are required. One represents the **dependent variable** and will be the variable for which you receive the **descriptive statistics**. The other is the **independent variable** and will be used in creating the subsets. Note that while SPSS calls this variable an **independent variable**, it may not meet the strict criteria that