

HOW TO USE SPSS®



A STEP-BY-STEP GUIDE TO ANALYSIS AND INTERPRETATION

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TENTH
EDITION

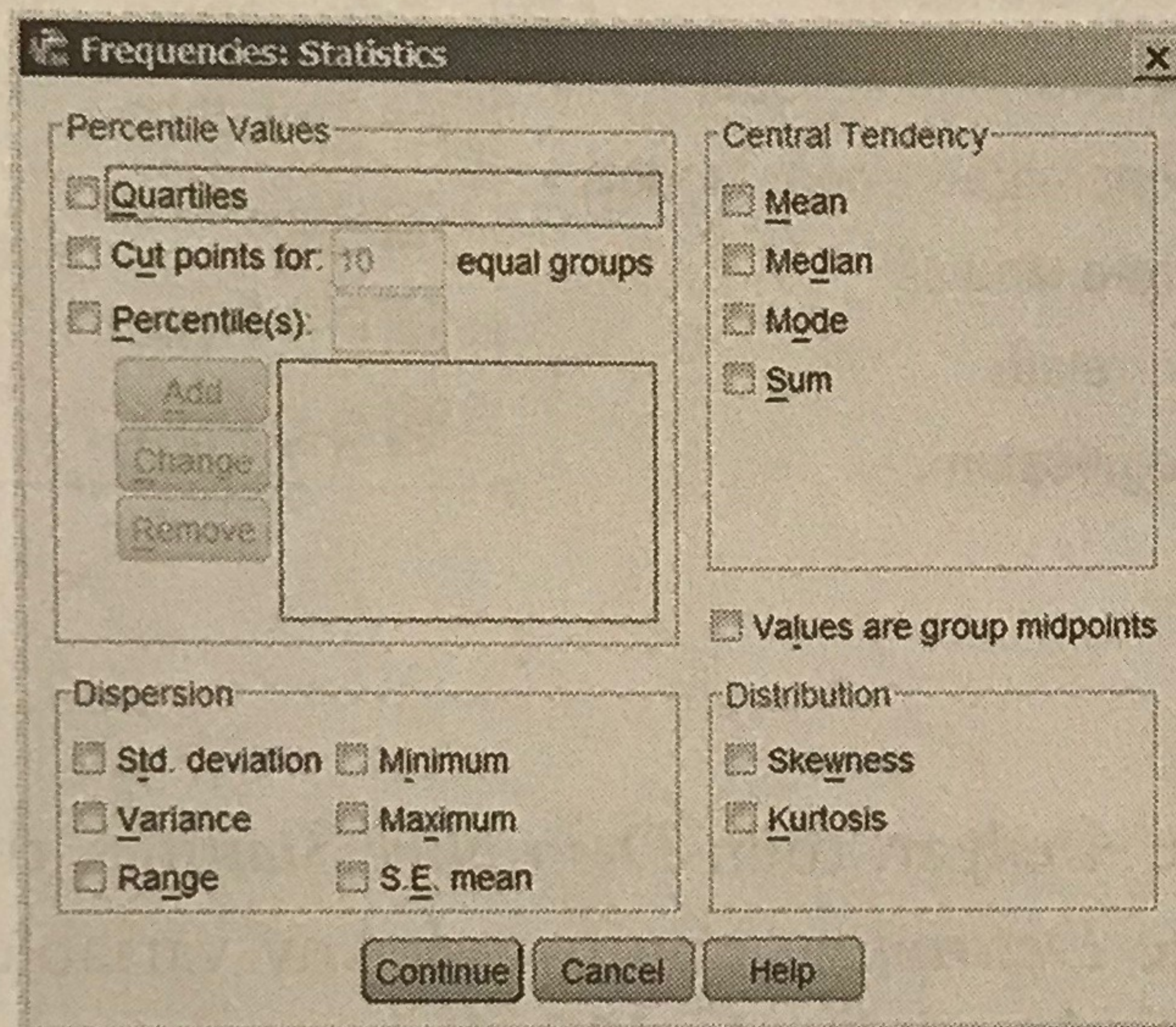


ROUTLEDGE

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 dataset.



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 above).

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

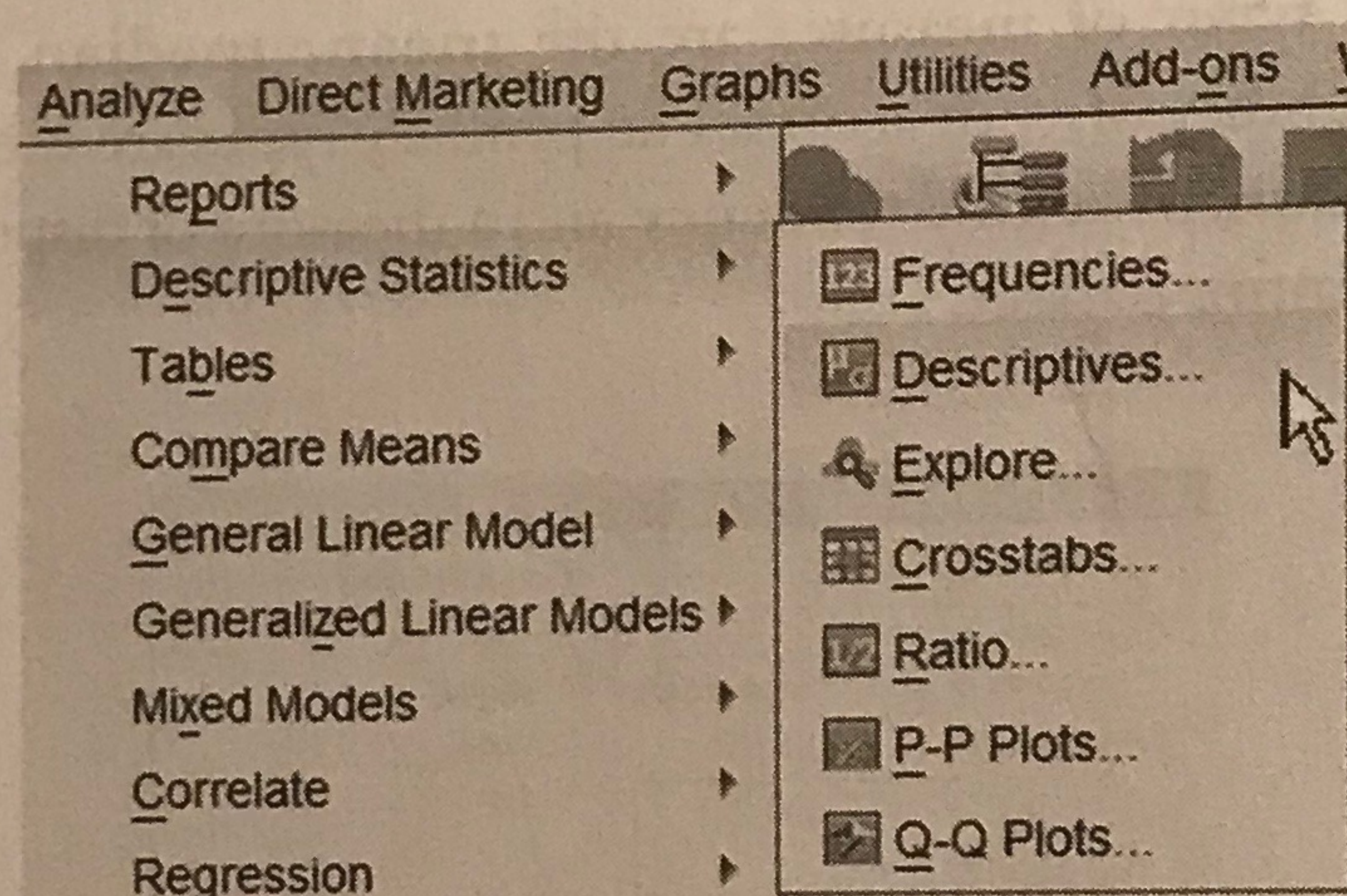
A measure of central tendency should be accompanied by a measure of dispersion. Thus, when reporting a **mean**, you should also report a **standard deviation**. When presenting a **median**, you should also state the **range** or interquartile **range**. The interquartile **range** can be determined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

SPSS Data Format

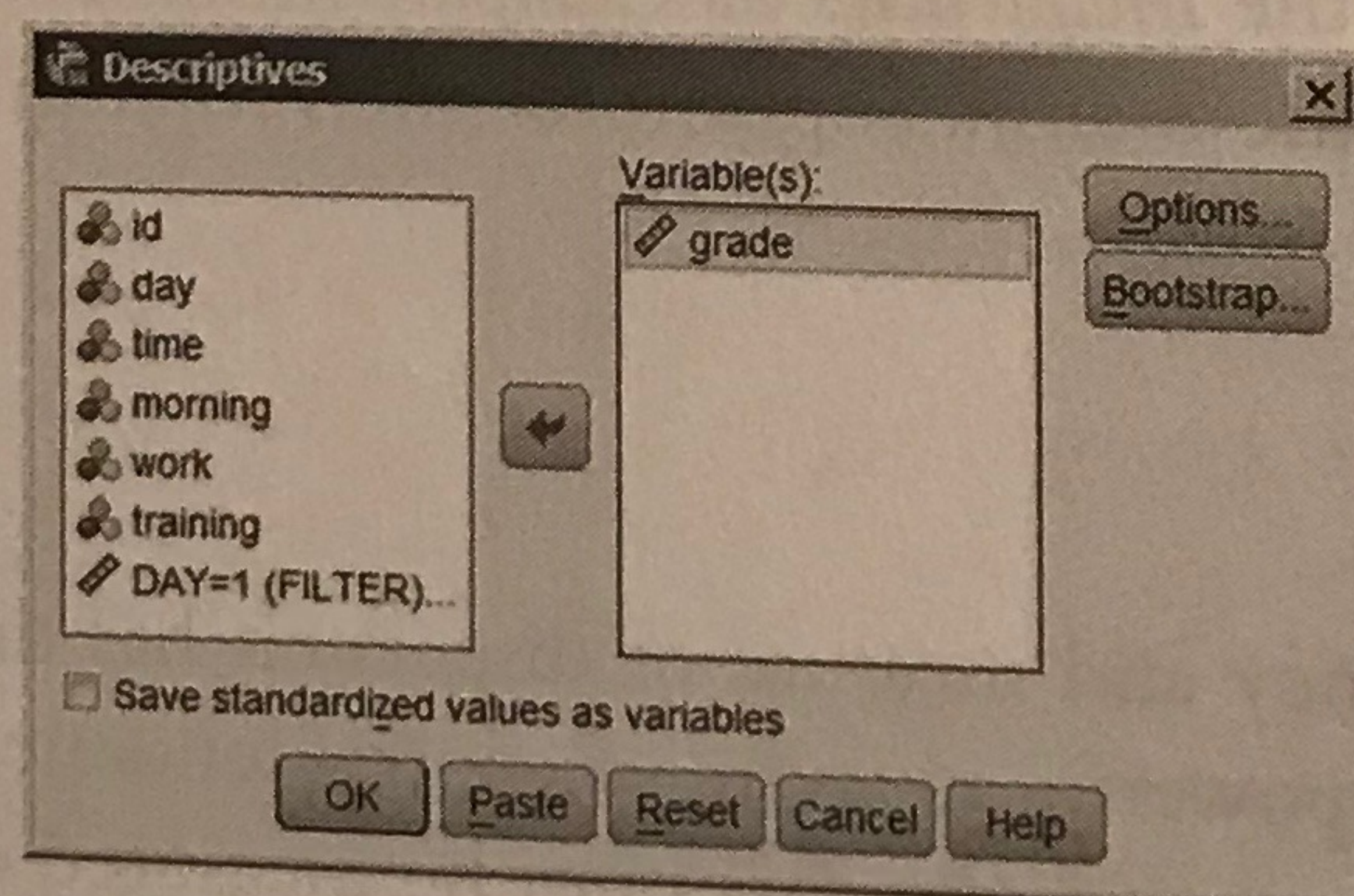
Only one variable is required.

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.

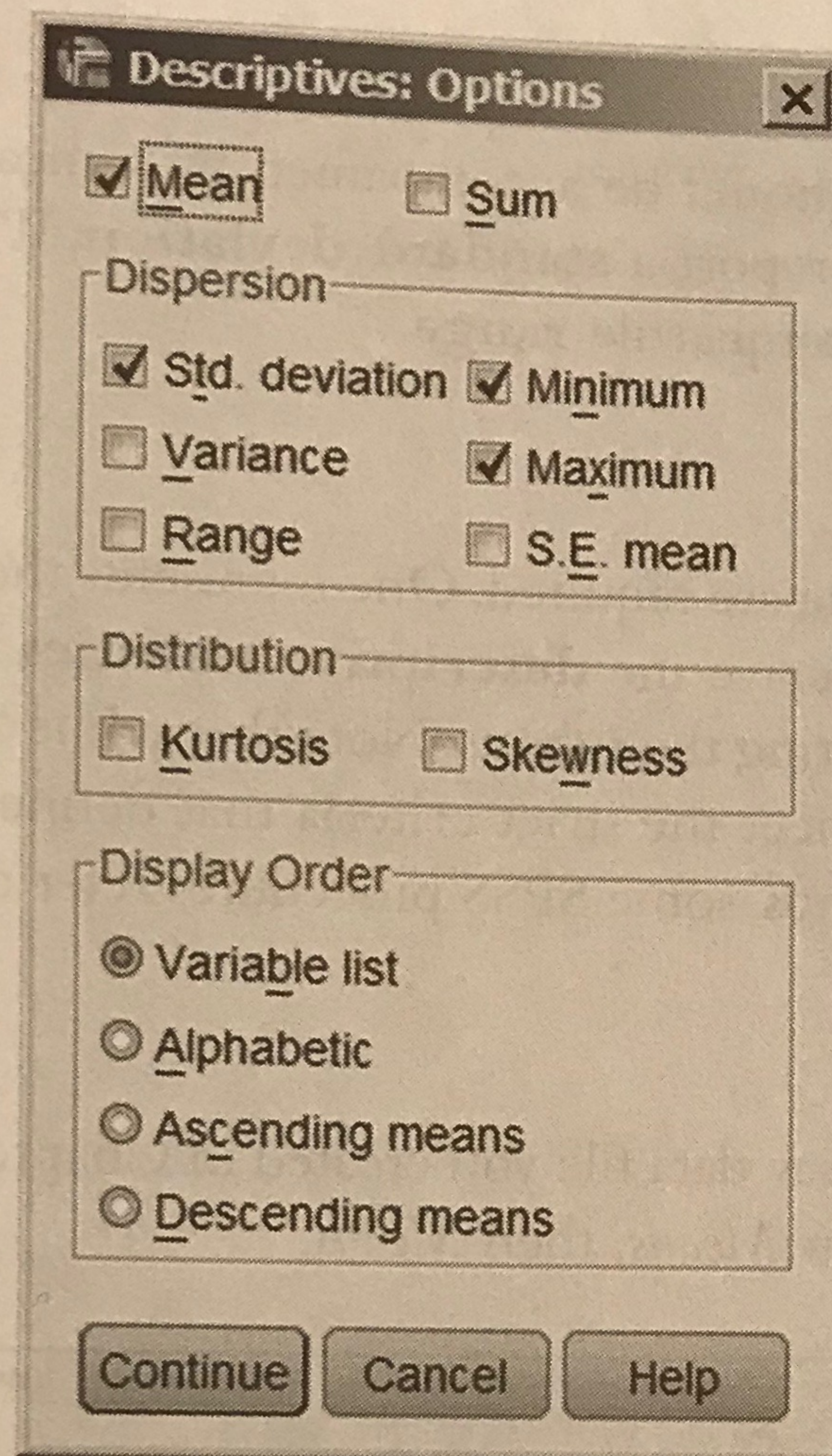


To run the command, click *Analyze*, then *Descriptive Statistics*, then *Descriptives*. This will bring up the main **dialog box** for the *Descriptives* command. Any variables you would like information about can be placed in the right blank by double-clicking them or by selecting them and then clicking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

Descriptive Statistics

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

Practice Exercise

Using Practice Dataset 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