Unit 1

Module 8

Name:

Block:

Statistical Reasoning in Everyday Life

Before You Read

Module Summary

Module 8 describes the three measures of central tendency and discusses the usefulness of the two measures of variation. The concept of statistical significance is explained and the criteria necessary to generalize experimental results is introduced.

Before beginning the module, take a moment to read each of the following terms you will encounter. You may wish to make vocabulary cards for each.

Key Terms

descriptive statistics

histogram

mode

mean

median

skewed distribution

range

standard deviation

normal curve

inferential statistics

statistical significance

While You Read

Answer the following questions/prompts.

8-1

1. Why is it important for a psychology student to understand statistics?

8-2

1. Why must care be taken when reading a histogram?

8-3

1. What are the three measures of central tendency, and what purpose does each of these measures serve?

2. Outliers, or extreme, "way-out" data that are significantly different from the majority of the data, have what effect on:

   a. the mean?

   b. the median?

   c. the mode?

   d. Which measure of central tendency provides the most accurate view of the data when there are outliers?

8-4

1. Identify the range of the following set: 29, 39, 40, 52, 55, 80.

2. What does the standard deviation tell us?

3. What would a large standard deviation indicate?

4. What would a small standard deviation indicate?

5. Using Figure 8.3 from the textbook, write the percentage of scores on a normal curve that fall within one standard deviation. Next, write the percentages that fall within two and three standard deviations.

6. Now that you have been introduced to the basics of descriptive statistics, review the following calculations and practice with the sample data below.

$$\boxed{2, 15, 9, 7, 12, 15, 3}$$

Measures of central tendency:

a. Calculate the mean, median and mode of the data above.

mean _____   median _____   mode _____

> ✐ *Point to note:* The mean can be pulled in the direction of the outliers, so often the median is a better measure of central tendency.

> ✐ *Point to note:*
> - If there are an odd number of data, the median will be the number in the middle after the data is arranged from highest to lowest.
>
>   2, 4, $\boxed{6,}$ 8, 10: 5 data points; median is 6
>
> - If there are an even number of data, the median will be the mean (average) of the two middle numbers after the data is arranged from highest to lowest.
>
>   2, 4, $\boxed{6, 8}$ 10, 12: 6 data points; mean is average of (6+8)/2, or 7

> ✐ *Point to note:* If more than one data point occurs with frequency, the data can be referred to as bimodal or multimodal.

Measures of variation: *How similar or diverse are the data?*

b. Calculate the range of the data. _____

> ✐ *Point to note:* When you take the highest number and subtract the lowest number, the result is the range.

> ✐ *Point to note:* Standard deviation calculations will not be required of you on the AP® Exam because you are not allowed to use a calculator.

8-5

1. What is the difference between descriptive statistics and inferential statistics?

8-6

1. What are the three principles to keep in mind when deciding to generalize from a sample?

2. In the field of psychology, what is the standard for deciding if a result is statistically significant?

3. What does it mean if a result is statistically significant?

After You Read

Module 8 Review

Complete the questions below to see if you have mastered the basics.

$$3, 6, 6, 8, 9, 22$$

1. Given the data set above, identify the

   a. mean _____   b. median _____   c. mode _____

2. Which measure of central tendency should be used to most accurately describe the data above? Why?

3. Using the data set above, identify the range. _____

4. Assume a distribution of aptitude test scores forms a normal curve with a mean of 100 and a standard deviation of 15.

   a. Within which standard deviation will most of the scores fall?

   b. If a student scores a 120, within which standard deviation will that score fall?