

AS1 (Assignment 1, Unit 2): Central Tendency and Shapes of Distributions

1. What is the goal of central tendency?

The goal of central tendency is to find the “middle” of a distribution. A measure of central tendency identifies one single measure that best describes a set of data.

2. Find the mean, median, and mode for the following sample of scores: 5, 4, 5, 2, 7, 1, 3, 5

Mean 4 Median 4.5 Mode 5

3. Find the mean, median, and mode for the following sample of scores: 3, 5, 7, 3, 9, 8, 3, 7, 5

Mean 5.6 Median 5 Mode 3

4. Find the mean, median, and mode for the scores in the following frequency table.

X	f				
6	1				
5	2	Mean	2.8	Median	2.5
4	2			Mode	1
3	2				
2	2				
1	5				

5. Find the mean, median, and mode for the scores in the following frequency table.

X	f				
8	1				
7	1				
6	2	Mean	5.1	Median	5
5	5			Mode	5
4	2				
3	2				

6. Explain why the median is often preferred to the mean as a measure of central tendency for a skewed distribution?

The median is often preferred to the mean as a measure of central tendency for a skewed distribution because the extreme values and outliers affect the mean.

7. A researcher conducts a study comparing two different treatments with a sample of participants divided into 2 treatments. The study produced the following data:

Treatment 1: 6, 7, 11, 4, 19, 17, 2, 5, 9, 13, 6, 23, 11, 4, 6

Treatment 2: 10, 9, 6, 6, 1, 11, 8, 6, 3, 2, 11, 1, 12, 7, 10

Calculate mean for treatment 1 and put your answer here 9.5

Calculate mean treat treatment 2 and put your answer here 6.9

Calculate the median for treatment 1 and put your answer here 7

Calculate the median for treatment 2 and put your answer here 7

Calculate the mode for treatment 1 and put your answer here 6

Calculate the mode for treatment 2 and put your answer here 6

8. Schmidt (1994) conducted a series of experiments examining the effects of humor on memory. In one study, participants were shown a list of sentences of which half were humorous and half were non-humorous. Schmidt then measured the number of each type of sentence recalled by each participant. The following scores are similar to the results obtained in the study:

Humorous	Non-humorous
4 5 2 4	5 2 4 2
6 6 6 6	2 3 1 6
2 5 4 3	3 2 3 3
1 3 5 5	4 1 5 3

Mean for humorous group: 4.2 Mean for non-humorous group: 3.1

Do the data suggest that humor helps memory? Answer “yes” or “no” and why:

Yes the data suggest that humor helps memory because for humorous sentences is equal to 4.2 which is greater than mean of non humorous sentences which is 3.1.

9. A researcher measured the time that a sample of students selected from Caldwell University spent studying on a given week during a semester. Here are the data in hours:

4, 6, 5, 4, 5, 7, 8, 6, 5, 7, 8, 9, 9, 1, 0, 2, 3, 5, 6, 4, 3, 7, 8, 4, 5, 6, 7, 8, 7, 6, 21, 7, 8, 9, 2, 3, 2

ANSWER the following questions based on the information given in question #9

Name the population: All students from Caldwell University.

Name the sample: Randomly selected students from Caldwell University

How many participants are in the sample? 37 participants

What is the scale of measurement? Ratio scale of measurement

Is the scale continuous or discrete? Continuous scale

9a. Use SPSS to compute the following (using the data from question 9):

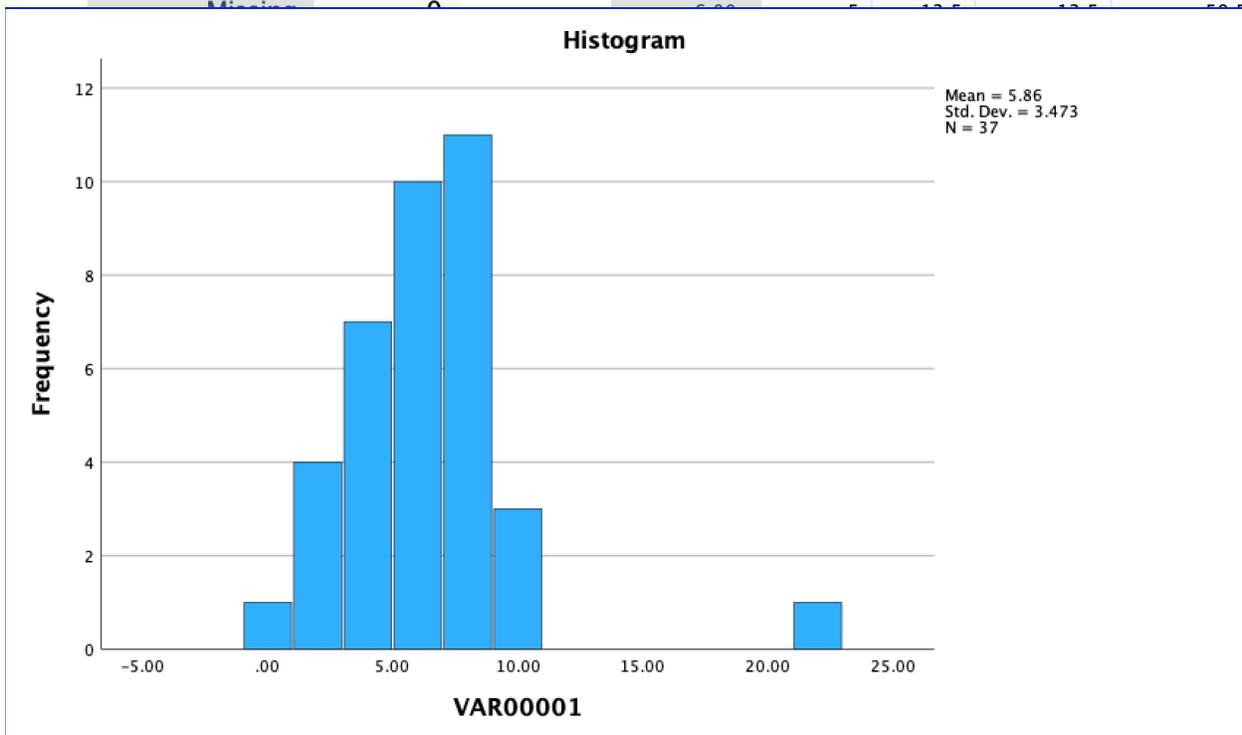
-generate a frequency table

-the appropriate graph

-mean

-

Statistics		VAR00001			
N	Valid	Frequency	Percent	Valid Percent	Cumulative Percent
	37	1	2.7	2.7	2.7
		1	2.7	2.7	5.4
		3	8.1	8.1	13.5
		3	8.1	8.1	21.6
		4	10.8	10.8	32.4
		5	13.5	13.5	45.9



median

-mode

PASTE your SPSS results here:

Based on your SPSS results, please answer the following questions:

What is the mean? 5.86 What is the mode? 7.00 What is the median? 6.00

What is the shape of this distribution? Answer= Negatively Skewed Distribution

Which is the “best” measure of central tendency for these data? Mean, medium, and mode

Why?

Mean, medium, and mode is the “best” measure of central tendency for these data because the shape of this distribution is negatively skewed which means that it is not symmetrical. Since the shape is not symmetrical it means that each answer will be a different amount which is why we need to find the mean, medium, and mode.

Going on to a different set of questions, which have nothing to do with any of the above questions:

10. Why are there three measures of central tendency rather than just one?

There are three measures of central tendency rather than just one because no one measure is always the best representative measure for a given set of data.

11. Name a situation where the mean would NOT be an appropriate measure of central tendency. Do not use an example from class lecture

If I had two sets of data, set 1 is: 2,4,5,7,8, and 9. The data set 2 is: 2,4,5,7,8,9, and 200. The mean for data 1 would equal to 5.8 which is considered a good measure of central tendency. However, for data 2 the mean would equal 33.6 which is not considered a good measure of central tendency because there is an outlier which is 200.

12. Name a situation where only the mode could be used as a measure of central tendency

A situation where only the mode could be used as a measure of central tendency is if there is a symmetrical distribution because then all three measurements of central tendency will be in the center which means all the measures will be the same exact amount.

13. If a distribution were perfectly symmetrical and Mary got an exam score that was equal to the median, and John got an exam score that was equal to the mean, what would you know about their scores?

Answer Their scores would be exactly the same.

14. A professor gave a very, very difficult exam. Vincent scored at the mode, Brandon scored at the mean, and Linda scored at the median. Place the names in order from who got the highest exam score to who got the lowest exam score.

Answer: Brandon (Highest) Linda (Middle) Vincent (Lowest)

15. A professor gave a very, very easy exam. Dan scored at the mode, Luci scored at the median, and Stephen scored at the mean. Place the names in order from who got the lowest exam score to who got the highest exam score:

Answer: Dan (Highest) Luci (Middle) Stephen (Lowest)

True / False Questions

Please type "T" if the statement is true, and type "F" if the statement is false in the provided spaces

- F 16. A student takes a 10-point quiz each week in statistics class. If the student's quiz scores for the first three weeks are 2, 6, 5, and 10, then the mean score is $M = 9$.

- T. 17. A sample of $n = 6$ scores has $\Sigma X = 48$. This sample has a mean of $M = 8$.

- F 18. For the scores in the following frequency distribution table, the mean is $M = 3$.

X	f
4	1
3	4
2	2

- F 19. The mean is considered to be the "balance point" for a distribution because exactly half of the scores are located above the mean and exactly half are below the mean.

- T 20. In a sample of $n = 3$ scores, if two scores are each below the mean by 2 points, then the third score is above the mean by 4 points.

- F 21. A sample has $n = 5$ scores: 2, 4, 5, 8, and 11. The median for the sample is 6.5.

- T 22. There are situations for which it is either impossible to compute a mean or the mean does not provide a central, representative value.

- T 23. A distribution of scores has a mean of 50, a median of 53, and a mode of 56. Based on this information, it appears that the distribution is negatively skewed.
- T 24. If a negatively skewed distribution has a mean of 50, then the median and the mode are probably both greater than 50.
- F 25. For a positively skewed distribution, the mean usually has a larger value than either the median or the mode.