

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

- What is the goal of central tendency?

To find the middle of a distribution that best describes a set of data by using one singular measure.

- 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

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

Mean_5.56 Median_5 Mode_3

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

<u>X</u>	<u>f</u>
6	1
5	2
4	2
3	2
2	2
1	5

Mean_2.79 Median_2.5 Mode_1

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

<u>X</u>	<u>f</u>
8	1
7	1
6	2
5	5
4	2
3	2

Mean_5.08 Median_5 Mode_5

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

Because in case of skewed score, the mean favors the positive or negatively skewed outliers much more than the median. The median is affected little to none when there are outliers, but the

mean is affected.

- 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 9.53

Calculate mean treat treatment 2 and put your answer here 6.87

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

- 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: 4.19 Mean for non-humorous group: 3.06

Do the data suggest that humor helps memory? Answer “yes” or “no” and why:
Yes because the mean was higher in the humorous group which indicates they were able to recall more humorous sentences.

- 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:

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

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

Name the population: caldwell university students

Name the sample: students selected that are studying at caldwell university

How many participants are in the sample? 37

What is the scale of measurement? interval

Is the scale continuous or discrete? continuous

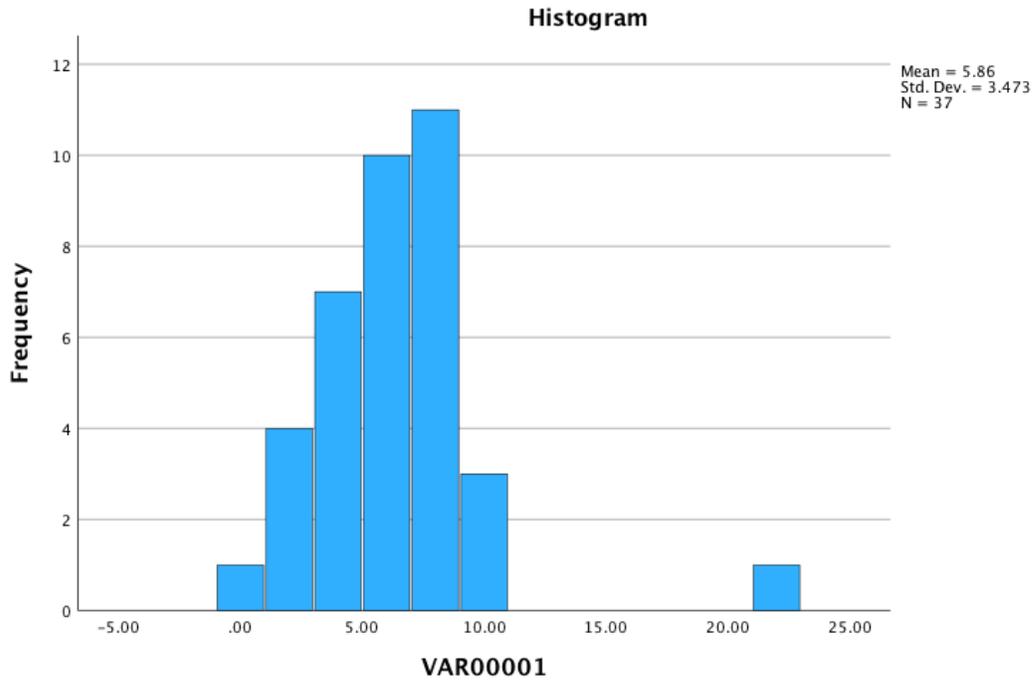
9a. Use SPSS to compute the following (using the data from question 9):

- generate a frequency table
- the appropriate graph
- mean
- median
- mode

PASTE your SPSS results here:

VAR00001					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	1	2.7	2.7	2.7
	1.00	1	2.7	2.7	5.4
	2.00	3	8.1	8.1	13.5
	3.00	3	8.1	8.1	21.6
	4.00	4	10.8	10.8	32.4
	5.00	5	13.5	13.5	45.9
	6.00	5	13.5	13.5	59.5
	7.00	6	16.2	16.2	75.7

8.00	5	13.5	13.5	89.2
9.00	3	8.1	8.1	97.3
21.00	1	2.7	2.7	100.0
Total	37	100.0	100.0	



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

What is the mean? 5.86 What is the mode? 7 What is the median? 6

What is the shape of this distribution? Answer: symmetric

Which is the “best” measure of central tendency for these data? Mean

Why?

The median is because there is a positive outlier of 21 and the median will be less affected by it.

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

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

Because based on the position of data or the data represented, a different measure of tendency is most accurate or represents the data better. This is referring to positively or negatively skewed distributions. Median would be less affected, but if there is a symmetrical distribution the mean would represent the data accurately. Assessing all three allows the researcher to see if there is a skew in the data.

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

Mean would not be correct to use in a situation where there are large outliers. Since it is taking an average from all data collected if there are large outliers the average will favor the numbers that are much lower or much higher than the rest of the data collected. Whenever data is skewed or nominal you cannot use mean.

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

When dealing with nominal data the mode is the only measure of central tendency to be used.

- 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: If it was perfectly symmetrical then the median and the mean would be the same, therefore their scores would be the same.

- 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 Linda Vincent

- 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: stephan Luci dan

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 $M = 8$.

 T? (2.85) 18. For the scores in the following frequency distribution table, the mean is $M = 3$.

<u> </u> X	<u> </u> 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.

___T___ 25. For a positively skewed distribution, the mean usually has a larger value than either the median or the mode.