

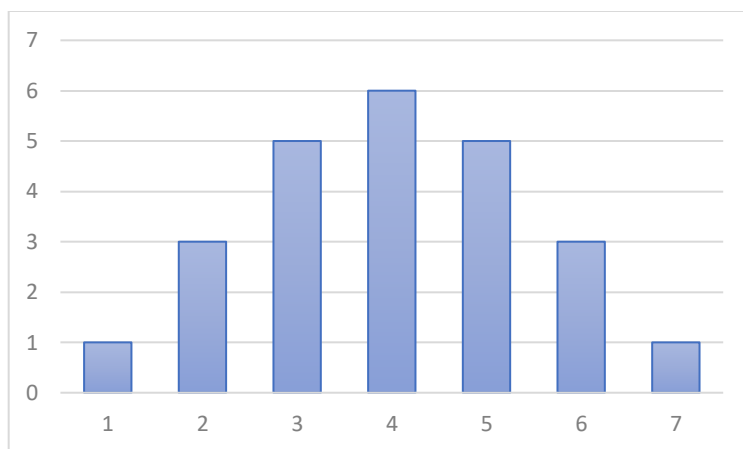
Central Tendency and Variability - KEY

HW #1

Directions: Please complete all of the sections. You get half of your points for finishing/turning it in on time and the other half for correctness. For the Jamovi section, please print the output from Jamovi and staple the two documents together. Have fun!

Section 1. Central Tendency

1. When is the median the best measure of central tendency? What about the mean?
Median: ordinal or interval/ratio when skewed
Mean: interval/ratio when symmetric (e.g., normally distributed)
2. What measure of central tendency is always at the 50th percentile?
Median (half are below, half above)
3. Some person approaches you on the street and asks you to state what the differences between the mean and the median are. At first you are alarmed, but then you remember that you took EDUC 6050. You confidently respond:
Examples include: mean is not resistant to outliers, median is; mean is the “balance point”, median is at the 50% percentile
4. If the distribution looks like the following figure, about where is the mean and about where is the median? Also, where is the mode?



Mean: 4

Median: 4

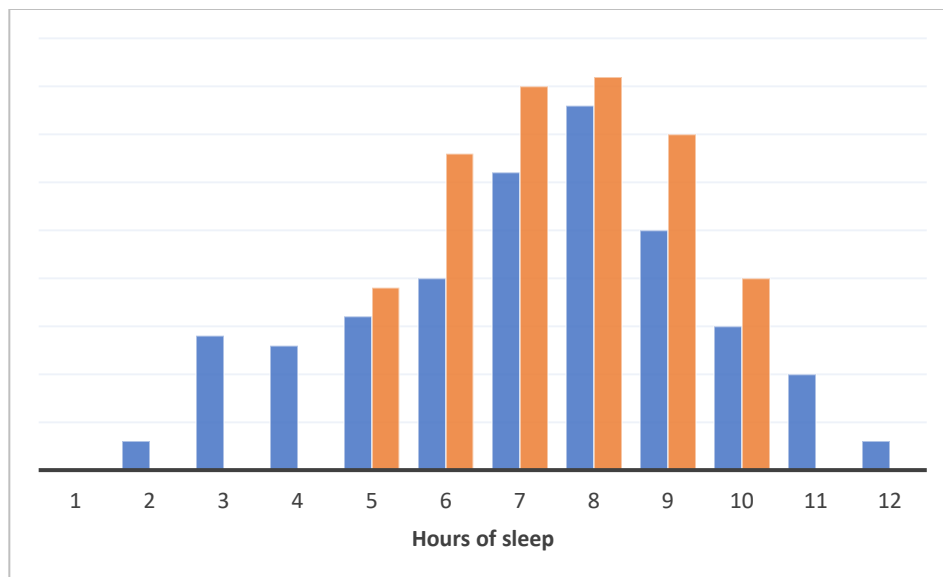
Mode: 4

In perfectly symmetric distributions, these four will always be the same.

5. For the previous answers, how did you determine where the mean and median were?
Two approaches: estimate seeing that the distribution is symmetric so the mean, median, and mode are likely to be the same (figure out one and you know the rest). The more appropriate approach in most cases is computing the median by ordering it and finding the middle value, the mean

Section 2. Variability

1. In the bar chart on the previous page, what is the range of the data?
 $7 - 1 = 6$ or 1 to 7
2. In that same chart, is the distribution skewed? Why?
No, the tails are the same on both sides.
3. You are told the standard deviation of the hours of sleep the individuals with a concussion is 3.2 hours. Next you are told that the standard deviation of the hours of sleep for individuals without a concussion is 1.1 hours. Which has more variability? Why?
Concussion group. The standard deviation is higher and the SD is a measure of variability.
4. Just judging visually, which group of bars (orange or blue) represent the concussed group?



Blue.

5. When is the standard deviation NOT an appropriate measure of variability?
Nominal, ordinal data or with interval/ratio data that is highly skewed.
6. Optional. Is there anything that is particularly confusing about variability for you?
Just your honesty :)

Section 3. Other Terminology

1. What is a sample in relation to the population? What makes it a “good” sample?
It is a piece (subset) of the population. It is a good sample if it is representative of the population. This is usually most likely achieved through random samples.
2. What is inferential statistics? How is it different than descriptive?
Inferential statistics is about drawing conclusions from our sample to our population of interest. Descriptive statistics describe the sample itself.
3. Provide two examples of each:

Nominal variables: any categorical variable that doesn't have an order

Ordinal variables: any categorical variable that has an order

Interval variables: any continuous variable where the zero does not indicate the absence of something
Ratio variables: any continuous variable where the zero indicates the absence of something

Section 4. Jamovi

Using your own data or the “OfficeParks” data:

1. Import the data set into Jamovi.
2. Pick two variables that you will use.
3. Clean the two variables (make sure Jamovi knows what is missing if there are missing values; check if there are any impossible values and if so, correct it; select the proper variable type for each variable [scale, nominal, ordinal]).
4. Produce a table showing the mean, median, and mode of each chosen variable in Jamovi.
5. What do these statistics tell us about the variable?

Answers vary

6. Produce a table showing the range and standard deviation of these two variables in Jamovi.
7. What do these statistics tell us about the variable?

Answers vary

8. Based on your understanding of this variable, do you think this variable is skewed? (We'll talk about visualization for the next assignment.)

Answers vary