**Quiz 1** **12pm Class**

**<u>Question:</u> What determines which numerical measures of center and spread are appropriate for describing a given distribution of a quantitative variable? Which measures will you use in each case?**

**Here are your answers in random order. See my comments.**

it must include a graphical display. A histogram would be a good method to give an appropriate description of a quantitative value. This does not answer the question.

For the quantative variable, the "average" must make sense. The values of the variables are numbers and one value is larger than the other. This does not answer the question.

IQR is what determines which numerical measures of center and spread are appropriate for describing a given distribution of a quantitative variable. The min, Q1, M, Q3, max are the measures I will use in this case. No, IQR does not determine which measure to use.

the overall pattern of the quantitative variable is described by its shape, pattern and spread. A description of the distribution of a quantitative variable must include a graphical display, which is the histogram,and also a more precise numerical description of the center and spread of the distribution. The two main numerical measures are the mean and the median. This is all true, but does not answer the question.

The two main numerical measures for the center of a distribution are the mean and the median. the three main measures of spread are range, inter-quartile range, and standard deviation. This is all true, but does not answer the question.

When examining the distribution of a quantitative variable, one should describe the overall pattern of the data (shape, center, spread), and any deviations from the pattern (outliers). When describing the shape of a distribution, one should consider: Symmetry/skewness of the distribution Peakedness (modality) - the number of peaks (modes) the distribution has. Not all distributions have a simple, recognizable shape. Outliers are data points that fall outside the overall pattern of the distribution. It is always important to interpret the features of the distribution (as they appear in the histogram) mean in the context of the data. This is all true, but does not answer the question.

I do not understand the question

The mean and median determines the numerical measures of center. The mean is used when showing the center as an average while the median shows the middle value of a data. The range and IQR determines the numerical measures of spread. The range shows the distance between

the min and max while the IQR shows the range of the middle 50% of a certain data. This is all true, but does not answer the question.

It all depends on how the problem is set out and what it is asking for. No.

Median measures the center Spread is appropriate to describe the mean That's not true.

Whether the shape or outliers will disproportionately affect the mean. If they do not, usually in the case of a symmetric distribution, i will use the mean to calculate the center. However, if outliers and shape will disproportionately affect the measure of the center, like in a skewed distribution, the median would be the best measure to use. Good answer, but you didn't mention the measures of spread.

*< No Response Given >*

The factor that determines which numerical measure of center and spread are appropriate for describing a given distribtion of a quantitative variable is the shape of the distribution. Good, but you didn't answer the other parts of the question

the numerical measures that we would use would be : the MIN. the Max which would be the range, the M (median), IQR which would also have Q1 and Q3 and the standard deviation. For the Spread we must use the range, IQR and the standard deviation. While for the center we need the mean and the median. This is all true, but does not answer the question.

In this case i will choose a histogram which can be used to describe center and spread. No.

*< No Response Given >*

Mean, Median and Mode Boxplot, histogram and stemplot. No.

It depends if the variability of what is being measured and if there is any outliers. If there are outliers it is better to use the median and IQR to measure the center and spread. If there isn't much variability and there are not any outliers then it may be better to use the mean and the standard deviation. Good, but it's not really the variability, it's the shape.

Given a distribution of a quantitative variable, i will use the 5 number summary (Min, Q1, Median, Q3, Max) to determine the center and the spread. Always???

I think that median and use range, inter-quartile range and standard deviation are appropriate. I will use median if there is any outliers but I will use mean if there is no outlier. What if the distribution is skewed with no outliers?

The numerical measures of the center that are appropriate for describing a given distribution of quantitative variables are by using the mean and the median. The mean takes the average value and takes data as it is very important to the center of the distribution. The median locates the

middle value as the center and the data being organized is very important to find correct values. The spread of the graph is analyzed by the range which gives you both the smallest to the biggest points on the graph. However, if you use the median of the graph only the IQR should be used. This is all true, but does not really answer the question.

Use mean for center only for symmetric dirtributions. Otherwise use the median. Good, but what about the spread?

*No Response Given >*

The information that we are analyzing or are interested in finding out. No.

center, variability, shape and outliers. The mean, Median and IQR . This doesn't make sense to me.

There are two numerical measures. One is values and the other is percentage. Both can be presented by a pie-chart or a histogram. However, it is difficult to show the distribution of a quantitative variable by a picture graph. No, this is not true, and doesn't answer the question.

To find the center, what we can do is find the median and the mean. The median splits data into halves equally. While the mean, shows the actual distribution of the data. To measure the spread, what we can do is find the range, IQR, and standard deviation. Range is max - min and to find IQR we must first find Q1 and Q3. Q3 - Q1 = IQR. For standard deviation, we can only use is when the shape is approximately symmetric and there are no outliers. If the shape is skewed, median and IQR are needed. If the measure is symmetric, we need to find the mean and standard deviation. GOOD.

It depends on what kind of distribution it is, whether its symmetric or if its skewed with outliers. If the distribution is symmetric then the mean can be used to find the center. When it is skewed right or left with high or low outliers then the median is better to use to find the center. The best measure of spread when the median is the center is the IQR. As for when the center is the mean, then standard deviation should be used since it measure the distance between a data point and the mean. Excellent.

*< No Response Given >*

shape of the distribution determines which numerical measures of center and spread are appropriate for describing a given distribution of a quantitative variable. Mean and standard deviation are used for a normal shaped/symmetrical distribution and median and IQR are used for unsymmetrical distributions. also taken into account are extreme values which influence the mean but not the median. Excellent.

To describe a given distribution of a quantitative variable, you would use the median and IQR to find the the spread and center. Always???

The overall pattern of the distribution of a quantitative variable is described by its shape, center, and spread. We use a histogram to describe the shape of the distribution and use the mean and median to estimate the center. To estimate the spread, we use the range, inter-quartile range, and standard deviation. This is all true, but does not answer the question.

Well it is always determined by the median or the mean, the range. The measure I would use depends on the type of graph I would do. No, this doesn't make sense to me.

The shape of a given distribution of a quantitative variable determines which numerical measures of center and spread are appropriate to use. In the case that the shape of a given distribution is symmetrical with no outliers, it would be appropriate to use the mean and the standard deviation as measures of center and spread. In all other cases, the median should be used to describe the center of the distribution because it is resistant to outliers. And the IRQ to describe the spread of the distribution. (or the five-number summary; max, min, range, median, irq) Excellent.

There are four cases to choose from 1. Categorical explanatory and quantitative response 2. Categorical explanatory and categorical response 3. Quantitative explanatory and quantitative response 4. Quantitative explanatory and categorical response for case 1 you probably should use side by side boxplots. For case 2 you probably should use two way table or a double bar chart. For case 3you probably should use a scatterplot. Each graph will tell you a different thing . But the question was about one single quantitative variable.

The median of the variables in a given distribution will be used as the center. The spread will be determined by the numerical value of the IRQ, because that will help you discover the variability. How about the mean and standard deviation?