

Q1: What are the criteria by which you can judge the adequacy of a measure of central tendency?

When evaluating the adequacy of a measure of central tendency, several criteria can be considered. These criteria help assess the appropriateness and effectiveness of a particular measure in representing the central or typical value of a dataset. Here are some commonly used criteria:

1. **Applicability:** A measure of central tendency should be applicable to the type of data being analyzed. Different measures are suitable for different types of data, such as numerical or categorical variables.
2. **Robustness:** The measure should be resistant to extreme values or outliers that may exist in the dataset. Outliers can significantly influence some measures, such as the mean, but have minimal impact on others, like the median.
3. **Representativeness:** The measure should accurately represent the central value of the dataset. It should give a good indication of the typical value around which the data are distributed.
4. **Sensitivity:** The measure should be sensitive to changes in the dataset. It should reflect variations in the data and provide meaningful information about the distribution's characteristics.
5. **Comparability:** The measure should allow for meaningful comparisons between different datasets or groups. It should facilitate comparisons across similar datasets to understand similarities or differences in central tendencies.
6. **Mathematical properties:** The measure should possess desirable mathematical properties, such as being well-defined, consistent, and easy to interpret.
7. **Sample size sensitivity:** The measure's performance should not heavily depend on the sample size. It should provide reliable estimates of central tendency for datasets of various sizes.
8. **Data level:** The measure should be appropriate for the level of measurement of the data, whether it is nominal, ordinal, interval, or ratio. Different measures are suited for different levels of measurement.

Common measures of central tendency include the mean, median, and mode. Each measure has its strengths and weaknesses, and the choice of measure depends on the nature of the data and the

specific goals of the analysis. It's often recommended to consider multiple measures of central tendency to gain a more comprehensive understanding of the dataset.

Q3. Describe the relative measures of dispersion

Relative measures of dispersion are statistical measures that express the degree of variability or spread of a dataset relative to its central tendency. These measures allow for the comparison of dispersion between datasets with different units or scales. Here are two commonly used relative measures of dispersion:

1. Coefficient of Variation (CV): The coefficient of variation is the ratio of the standard deviation to the mean, expressed as a percentage. It provides a relative measure of dispersion that is independent of the scale of the data. The formula for calculating the coefficient of variation is:

$$CV = (\text{Standard Deviation} / \text{Mean}) * 100$$

The CV is useful when comparing the variability of datasets with different means or units. A smaller CV indicates less relative variability, while a larger CV suggests greater relative variability.

2. Relative Standard Deviation (RSD): The relative standard deviation is similar to the coefficient of variation but is expressed as a decimal rather than a percentage. It is calculated by dividing the standard deviation by the mean and multiplying by 100 to convert it into a percentage. The formula for calculating the relative standard deviation is:

$$RSD = (\text{Standard Deviation} / \text{Mean}) * 100$$

The RSD provides a measure of relative dispersion and is particularly useful when dealing with variables that have a natural zero point, such as physical measurements. Like the CV, a smaller RSD indicates less relative variability, while a larger RSD suggests greater relative variability.

Both the coefficient of variation and relative standard deviation allow for comparisons of dispersion across datasets with different means or units, making them useful for analyzing and comparing data that have different scales or units of measurement.