

Measures of Central Tendency

(Please Return to Mr. Adams)

Mean = sum of the responses divided by the total responses. The mean (average) is perhaps the most useful measure of central tendency but can be skewed by extremely high or low numbers in the data set.

Median = the number that falls in the exact middle of a group of numbers arranged in numerical order. Note that the median of a group of even numbers is calculated by taking the average (mean) of the two numbers in the middle. The median in a number set that is balanced can reflect what the typical piece of data looks like.

Mode = the number that occurs most often in the number set. The mode shows the most frequent response, which is sometimes a more accurate representation of the results than the mean.

Variance = The average of the squared differences from the Mean. To calculate the variance: 1st Work out the mean (The simple averages of the numbers). 2nd For each number subtract the Mean and square the results (the squared difference). 3rd work out the average of those squared differences.

Standard deviation = the standard deviation shows how much each piece of data differs from the others. The higher the standard deviation, the more different the data are. Larger data sets typically yield lower standard deviations.

	Deviation From	
Punting distance	Mean (40 yards)	Deviation squared
36 yards	-4 yards	16 yards ²
38 yards	-2 yards	4 yards ²
41 yards	+1 yard	1 yard ²
<u>45 yards</u>	+5 yards	<u>25 yards</u> ²

$$\text{Mean} = \frac{160}{4} = 40 \text{ yards} \qquad 46 \text{ yards}^2 = \text{Sum of (deviations)}^2$$

$$\text{Standard deviation} = \sqrt{\frac{\text{Sum of (deviations)}^2}{\text{Number of punts}}} = \sqrt{\frac{46 \text{ yards}^2}{4}} = 3.4 \text{ yards}$$

Steps for calculating the Standard deviation

- 1st Calculate the mean.
- 2nd Determine how far each score (punt distance in this example) deviates (differs) from the mean.
- 3rd Square the deviation scores and average them. Note you can't just average the deviations without squaring them, because the sum of the deviations scores will always be zero.
- 4th Take the square root of the average of the squared deviation scores. This step brings us back to the original units – yards rather than yards squared.